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CONTENTS

		PAGE
Rubeosis iridis diabetica	*F. B. Fralick*	123
Ophthalmoscopy and diagnosis of illness	*A. J. Bedell*	139
Ocular malingering in the Armed Services	*A. C. Unsworth*	148
Patron saints of the eyes	*F. L. P. Koch*	160
Ocular therapy with penicillin	*C. A. Mietus*	173
Serologic studies in acute eye diseases	*C. C. Gray and W. A. Moor*	180
Intraocular injection of penicillin	*V. La Rocca*	183
Congenital cataract following rubella in mother	*C. A. Perera*	186
Chemotherapy in treatment of sympathetic ophthalmia	*A. E. Long*	187
Tricho-epithelioma of eyelid	*J. E. L. Keyes and F. B. Queen*	189
Endophthalmitis subsiding after penicillin therapy	*M. I. Green and R. Jakobovits*	191
Luxation of lens with voluntary control	*O. R. Wolfe and L. L. Mayer*	193
Eye injured by lightning; pathologic changes	*L. B. Sheppard*	195
The Siniscal-Smith lid everter	*A. A. Siniscal*	198
Refraction clinic	*A. E. Sloane*	200
Corneal forceps	*W. Moehle*	201

DEPARTMENTS

Society Proceedings	203
Editorials	211
Correspondence	215
Abstracts	217
Pan-American Notes	240
News Items	241

For complete table of contents see advertising page VII

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FIG. 1 (FRALICK), RUBEOSIS IRIDIS DIABETICA

AMERICAN JOURNAL OF OPHTHALMOLOGY

VOLUME 28 FEBRUARY, 1945 NUMBER 2

RUBEOSIS IRIDIS DIABETICA*

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Rubeosis iridis diabetica is the term given by Salus[1] to signify the presence of new-formed blood vessels in the sphincter region of the anterior surface of the iris. He rightly believed that he was dealing with a syndrome not previously described, since the condition was observed bilaterally in three diabetic patients, all eventually showing glaucoma. Thirty-two case reports, including those of his three patients, showing rubeosis of the iris in association with diabetes have appeared in the literature.

Salus emphasized that "rubeosis iridis is not rare, as it is frequently seen in its minor degrees but only occasionally in a well-defined manner." He called it "a second diabetic iris change," the first being black aqueous from hydroptic degeneration of the posterior iris epithelium. Salus's original description bears repetition despite the accumulation of additional information concerning rubeosis iridis since his communication was published:

"The normal iris is covered by radially arranged groups of light-red capillary nets which are placed closely together. They are connected by thicker, shorter, and horizontally running small vessels. These groups of vessels end in the vicinity of the pupil at the pigment margin without extending over it. They terminate at the ciliary end of the pupillary region so that their utmost ends cover it but they do not extend over its margin to any considerable degree. Thus, the whole pupillary part of the iris is covered by a dense net of chiefly radially running capillaries; it acquires a rose-red tinge, particularly striking in a blue iris, which ends suddenly at the ciliary border. Starting at the capillary net, there are more or less numerous larger light-red vessels in irregular curves spreading over the iris and disappearing in the angle of the anterior chamber. They collapse if one presses upon the corresponding part of the limbus and are filled again from the side of the iris after pressure is discontinued."

At first, Salus was under the impression that the iris condition which he described was somehow caused by glaucoma, probably through venous stasis. Waite and Beetham[2] were of the opinion that rubeosis was a sequel to hemorrhagic glaucoma, not uncommon in diabetics, rather than a sequel to diabetes itself, in their excellent investigation of ocular complications found in 2,002 consecutive diabetic patients. Salus, however, after observing rubeosis iridis in two eyes not manifesting glaucoma for two and five years, respectively, reversed his impressions. This observation has been substantiated by Gil,[3] v. Sallmann,[4] Motolese,[5] Gallino,[6] and Fehrmann.[7] Thus, it may quite definitely be accepted that it is the vascular proliferation on the iris that eventually leads to glaucoma. Credit should therefore also be given to Salus for first suggesting that the capillary changes of the iris precipitated the glaucoma and that differentiation be made between the usual primary glaucoma and the type manifesting rubeosis iridis in the eye of diabetics.

Following Salus's observations, but without adding significantly to the knowl-

* Candidate's thesis accepted by the American Ophthalmological Society, June, 1944.

edge of rubeosis iridis, Axenfeld,[8] Arruga,[9] Waldstein,[10] Lawrence and Levy,[11] Gallino,[6] and Motolese[5] reported similar eye conditions. The gonioscopic and pathologic findings of an eye showing rubeosis iridis and glaucoma in a diabetic individual was first described by Kurz[12] in 1937. Salus's conception of the cause of glaucoma in these eyes was confirmed and further elaborated by these findings.

By gonioscopic examination Kurz found that the chamber angle was bridged here and there by peripheral synechiae of varying width, and that the iris surface in the region of the anterior synechiae were elevated, giving the iris "the appearance of corrugated iron." He described large newly developed vessels on the iris ridges. Clumps or knots of fine vessels quite similar to, but not tending to be so diffusely disposed as those seen in the sphincter region, were noted in the valleys between the ridges. In this instance, Schlemm's canal was filled with blood and seemed to be directly connected with the vascular proliferation in the region of the anterior synechiae. Kurz described innumerable delicate vascular loops forming nets which run from the surface of the iris up over and partially covering the corneoscleral trabeculum. These changes advanced as time elapsed, and caused the crest of the iris waves to become higher and broader until the entire circumference of the chamber was finally filled with the adhesion.

In another significant observation in connection with rubeosis iridis, Kurz found that the vascular net in a rubeotic eye disappeared with the development of iris atrophy. Therefore, as these eyes go into absolute glaucoma they might not show evidence of a previously existing rubeosis iridis. This fact was beautifully demonstrated in two patients presented by Motolese. Both of his patients had one absolute glaucomatous eye without rubeosis, and both had rubeosis but as yet no glaucoma in the other eye.

The slitlamp and gonioscopic findings were confirmed by Kurz in pathologic studies of a rubeotic eye. The changes in the iris consisted of extensive proliferation of the vessels in the sphincter and ciliary regions accompanied by extensive extravasations. No similar vessel proliferations were noted in the ciliary body. It is hard to conjecture just why the anterior surface of the iris should be selected as the site of this peculiar vessel proliferation in diabetic and nondiabetic rubeosis. It has not as yet been determined whether there are differences in the aqueous of diabetics with and without rubeosis. Rubeotic eyes examined pathologically have not shown significant vascular changes in the ciliary processes to confirm the theory that degenerative vascular changes in the presence of diabetes might so alter the metabolic constituents of the aqueous as to bring about vascular proliferation on the iris surface in the regions of the greater and lesser arterial circles. Hemorrhagic retinopathy and a tendency to vascular proliferations in and on the retina and optic nerve were noted by Kurz,[12] and later by Favaloro,[13] Fehrmann,[7] and Sugar[14] in pathologic examinations of rubeotic eyes.

Two cases presenting the clinical picture of rubeosis in the absence of diabetes have been reported by Fehrmann.[7] He attempted to establish a differential diagnosis that would enable one to distinguish the two entities, but the clinical differences were slight and the pathologic picture of both was that of vascular and circulatory changes. In the comparative clinical and pathologic studies of the diabetic and nondiabetic rubeotic eyes he pointed out essential differences sufficient for him to place them as entities. He found the nondiabetic rubeotic iris vessels to be larger and to run in a layer

of connective tissue attached to the anterior limiting layer and at times to surpass the pupillary margin. The latter has never been observed in rubeosis. The iris stroma in nondiabetic patients contains connective tissue which so far has not been observed pathologically in rubeosis. Nondiabetic glaucomatous scar tissue in the iris angle consists chiefly of dense tissue whereas in rubeosis synechiae the capillaries predominate in the adhesion and extend to the angle. Rubeosis is often accompanied by new-vessel formation in and on the papilla and in the retina underneath the limitans interna.

A study of the reported cases reveals that rubeosis iridis occurs in cases of severe diabetics in the young as well as in those observed in older cases of mild diabetes which have not been well controlled. For some time we have been impressed by the fact that the metabolic disturbances are often much more serious in the juvenile diabetic than in senile cases. We, therefore, must conclude that rubeosis does not depend entirely upon the severity of the diabetes. It is my opinion that rubeosis iridis is caused chiefly by vascular and circulatory changes, but the diabetes must be considered as an etiologic factor. If this were not true, the syndrome would be seen in nondiabetics with circulatory changes.

Other points to consider are the possible relationship between hypertension and rubeosis as mentioned by Kurz,[12] and the fact that hypertension and diabetes together in the same patient manifest a much higher percentage of vascular pathologic change than when either is alone. Hypertension and diabetes were associated in thirteen of the 32 reports of rubeosis. Patients suffering from diabetes complicated by hypertension were not significantly younger (average 59 years) than were those who had not the complication of hypertension (average 57 years). As yet, one does not see any more than a possible relationship between rubeosis iridis diabetica and arterial hypertension from the small number of cases so far reported.

The writer has seen three patients who presented the syndrome of rubeosis iridis diabetica. In addition, two others were seen whose pathologic picture did not conform to the syndrome but so closely approximated the findings that a differential diagnosis was difficult except for the absence of diabetes. These five patients are herewith presented for comparison of their clinical and pathologic manifestations.

Case reports

Case 1. R. M., a man, 61 years old, had noted gradual failure of vision in both eyes for eight months. No inflammation nor pain was experienced until three weeks before examination, when the right eye became congested, painful, and the vision markedly decreased. He had been a known diabetic for 12 years before, but not treatment had been instituted until the past four years, when dietary and insulin treatments were started. For the past two years he had used no insulin and had not been careful with his diet so that he was occasionally not sugar free.

The *eye examination* revealed vision, O.D. sufficient to count fingers and O.S. 2/60. The intraocular pressure (Schiøtz) O.D. was 90+ and O.S. 20 mm. Hg. The right eye was markedly congested throughout. The cornea was edematous; the fundus examination was therefore impossible. The anterior chamber was of normal depth. On the blue iris surface for a width of about 1 mm. about the pupil and inside the zig-zag line there was a definite reddish flush produced by the presence of clumps of fine new-formed capillaries as seen by the slitlamp. These

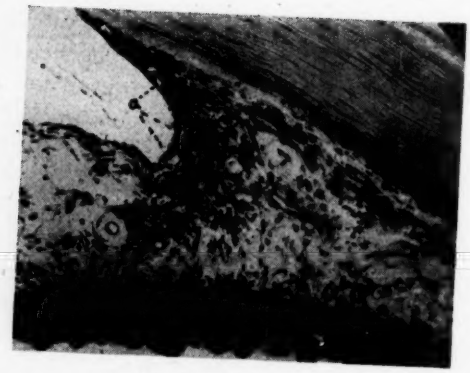


Fig. 2

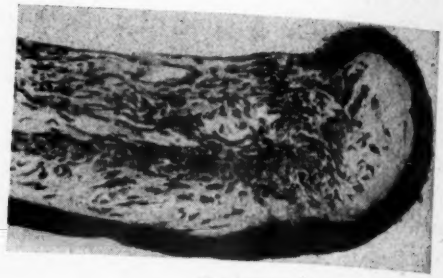


Fig. 3

Fig. 4

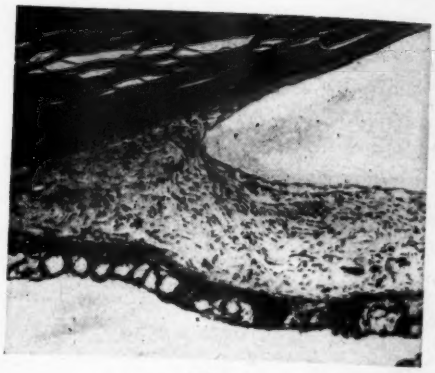
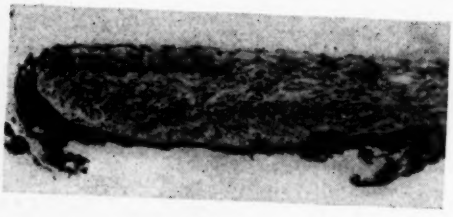


Fig. 5



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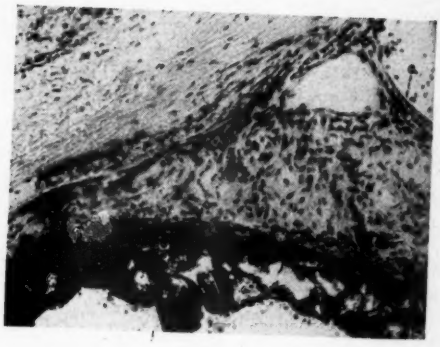

Fig. 7

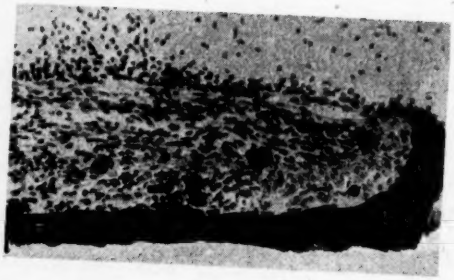

Fig. 8

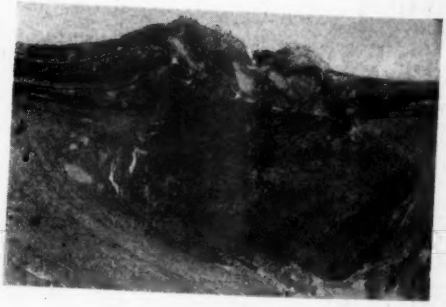

Fig. 9

tufts of capillaries were not diffusely disposed about the pupil but were patchy in their distribution. Several larger vessels, radiating from these vascular tufts, proceeded toward the iris base. These radiating vessels either disappeared behind the limbus or ended in capillary tufts on the anterior iris surface before reaching the limbal area. The peripheral capillary tufts also disappeared behind the limbus. The pupil was round, measuring 4 mm. in diameter, and was fixed to light and in accommodation. No synechiae were found. The iris stroma aside from the new-formed vessels appeared normal. No keratitic precipitates were present. Transillumination was negative for intraocular tumor.

The left eye presented a normal anterior segment. The vitreous was loaded with fine opacities. There was a subhyaloid hemorrhage below the disc. Many lipoid infiltrates were noted in and about the macular area. Numerous scattered punctate retinal hemorrhages were present throughout. The retinal arterioles showed marked sclerosis and variation in caliber.

Gonioscopic examination of the right eye showed the presence of complete anterior synechiae. The peripheral new-formed vessels on the anterior iris surface in some places extended onto the posterior surface of the cornea and in other places it did not reach the corneal surface. The large vessels seemed to disappear in the capillary tufts or iris stroma. The left eye presented normal angle markings and no new-formed vessels on the anterior iris surface peripherally.

General physical examination showed a blood pressure of 180/120; advanced generalized arteriosclerosis; and moderate cardiac enlargement with blowing apical systolic murmur.

Laboratory examinations: Blood Kahn negative. Fasting blood sugar 276 mg. percent. Urine showed 4+ albumen, 4+ sugar, many red blood cells, and waxy and granular casts.

Diagnoses. O.D., rubeosis iridis diabetica; secondary glaucoma. O.S., retinitis hemorrhagica; retinal arteriolar sclerosis. Diabetes mellitus. Arteriosclerotic and hypertensive heart disease with cardiac enlargement and nephropathy. Generalized arteriosclerosis.

Figs. 2-9 (Fralick).

Fig. 2. Case 1, right eye. Photomicrograph showing peripheral glaucomatous anterior synechia. New-formed blood vessels seen to extend from anterior iris surface to cornea at *a*.

Fig. 3. Case 1, right eye. Photomicrograph showing new-formed "rubeotic" blood vessels on anterior iris surface in scar tissue causing ectropion uveae.

Fig. 4. Case 1, right eye. Photomicrograph showing hyaline coagula associated with hemorrhagic retinopathy in the outer plexiform layers of the retina.

Fig. 5. Case 2, left eye. Photomicrograph showing typical glaucomatous anterior synechia without prominence of blood vessels in the scar. New-formed blood vessels on the anterior iris surface peripherally extend along synechia to cornea. Hydroptic degeneration of posterior pigment epithelium of iris is marked.

Fig. 6. Case 2, left eye. Photomicrograph showing new-formed blood vessels on the anterior iris surface in an inflammatory membrane which causes ectropian uveae.

Fig. 7. Case 2, right eye. Photomicrograph showing glaucomatous anterior synechia without blood vessels in the scar. At *a* is a blood vessel extending from the anterior iris surface to the cornea. Hydroptic degeneration of the posterior iris pigment epithelium is marked.

Fig. 8. Case 2, right eye. Photomicrograph showing thickening of anterior stromal tissue of iris causing ectropion uveae. New-formed blood vessels on anterior iris surface in sphincter region are conspicuous.

Fig. 9. Case 2, right eye. Photomicrograph showing organized inflammatory and hemorrhagic exudate on optic disc and retina. Exudate extends between retina and choroid.

Course. Miotics were employed and did not decrease the tension nor ocular pain. The right eye was enucleated.

Pathologic examination. O.D., Army Medical Museum accession number 73483. *Gross:* Firm eye measuring 25 by 24 by 24 mm. The cornea is clear. The eye is opened in the horizontal plane. The vessels radiating from the optic disc are prominent. The region surrounding the disc is thickened and dotted with opaque and hemorrhagic areas. The lens is opaque. *Microscopic:* Descemet's membrane is irregularly thickened at the periphery. The iris shows peripheral anterior synechiae of the typical glaucomatous type. There is no noticeable increase in the blood vessels in this scar as compared to the usual glaucomatous scar. There are some new-formed blood vessels on the peripheral anterior iris surface, which, along with scar tissue, extend forward for a short distance on the posterior surface of the cornea. There is a variable amount of iris atrophy. At some points of the pupillary margin a variable amount of ectropion uveae exists. There is a definite thickening of the stromal tissue on the anterior iris surface, indicating an inflammatory reaction in this case. There is seen a variable amount of new-formed vascularization, particularly over the sphincter muscle. Some hemorrhage is noted in the iris in the region of the anterior synechiae. There is slight hydroptic degeneration of the iris pigment epithelium. Pigment on the anterior lens capsule and a comparable loss of pigment from the posterior iris surface indicate the former site of a posterior synechia. The ciliary processes are hyalinized. There are some hyalinization of the walls of the retinal vessels and hemorrhages in the nerve fiber and outer plexiform layers. Numerous hyaline coagula are present in the outer plexiform layer, particularly in the macular region, and in this layer are also seen lipoidal histiocytes. There is a small area of microcystic degeneration on the nasal side posteriorly. A little hemorrhage appears in the vitreous chamber. The optic disc and lamina cribrosa are slightly depressed. No new-formed vessels are seen on the surface of the retina and optic disc.

CASE 2. B. G., a woman, aged 34 years, had noted visual failure in both eyes 10 months previously, and had not been able to read after two months. One week before examination the left lids became so edematous that she could not open the eye. There was pain and inflammation of the eyeball associated with the edema. She had learned that she had diabetes and hypertension during pregnancy, 14 years before and had been treated for these since then, but had found them both difficult to control. She had noticed dyspnea on walking up one flight of stairs. She also had had convulsions during the aforementioned pregnancy.

The *eye examination* showed an uncorrected vision of O.D. 1/60, and O.S. "moving objects." The intraocular pressure (Schiøtz) was O.D. 29 mm. and O.S. 90+ mm. Hg. The external examination of the right eye was normal except for the absence of the direct light pupillary reflex. The fundus showed scattered punctate retinal hemorrhages, scattered lipoid retinal infiltrates centrally, and marked retinal arteriolar sclerosis.

The left eye showed edema of the cornea but no keratitic precipitates. There were no posterior synechiae. The pupil was dilated to 4 mm. and fixed, irregular in outline. Just outside the pigmented margin of the pupil the iris showed a fine network of new-formed vessels which covered the sphincter zone and gave a reddish hue to this portion of the iris. From this vascular zone on the surface of the iris several more or less straight

vessels coursed toward the base of the iris, some disappeared behind the limbus, and others were found to terminate in small capillary networks. The remainder of the iris did not appear to show signs of inflammation. The fundus examination was impossible for details because of the edematous cornea. Transillumination was negative for intraocular tumor.

Gonioscopic examination. The patient was too ill to permit study.

General physical examination revealed a blood pressure of 200/100; adenoma of the right lobe of the thyroid; and heart of borderline size with systolic murmur at the apex.

Laboratory examinations. Urine showed 4+ albumen, 2+ sugar, and amorphous casts. Blood—hemoglobin 70 percent, red blood cells 4.01, white blood cells 11,750; differential and smear normal. Blood Kahn negative. Fasting blood sugar 140 mg. percent. Blood non-protein nitrogen 53.5 mg. percent.

Diagnoses. O.S., glaucoma (acute, congestive); rubeosis iridis diabetica. O.D., retinitis hemorrhagica; glaucoma (secondary). Diabetes mellitus. Chronic glomerular nephritis. Secondary anemia. Nontoxic thyroid adenoma. Secondary hypertension.

Course. Intensive miotic therapy together with 15 mg. retrobulbar mecholyl chloride reduced the tension in the left eye to 47 mm. Hg (Schiøtz), but after 24 hours the tension was again stony. The patient was extremely ill and the relatives refused the advice of enucleation of the left eye and removed the patient from the hospital. Tension in the right eye was reduced to 22 mm. (Schiøtz), but it was felt that this eye also was headed for trouble. The left eye was later removed by Dr. Ray Hughes of Detroit, Michigan, and sent to the Army Medical Museum.

The right eye remained painless and the tension normal until two months later, when the patient returned to Dr. Hughes with a tension of 10 mm. Hg (Schiøtz). The pupil was dilated and immobile. Vision was 20/300. The anterior chamber was deep. The patient had no pain. There was a well-developed rubeosis iridis. The cornea was clear. Fundus examination at this time showed retinal hemorrhages and a prepapillary growth of new-formed blood vessels which extended forward into the vitreous for 5 to 6 diopters. Mecholyl and prostigmin contracted the pupil to pinhead size and the tension was reduced to 50 to 55 mm. Hg (Schiøtz). Under the influence of the vaso-constrictive mecholyl, the rubeotic vessels disappeared and the iris assumed its normal appearance. Corneal abrasion and ulceration together with violent uveitis developed as the result of tonometry, and the right eye was enucleated by Dr. Hughes. This eye was also sent to the Army Museum.

Pathologic examination. Army Medical Museum accession number 75587. O.S.: *Gross:* Firm eye measuring 25 by 24 by 25 mm. The cornea appears clouded. The eye is opened in the horizontal plane. The region surrounding the macula is opaque. The vessels radiating from the disc are distinctly defined. The lens is opaque. There are a few posterior synechiae at the pupillary margin. *Microscopic:* A little hemorrhage is present in the anterior chamber. There are peripheral anterior synechiae of the characteristic glaucoma type except that there are new-formed blood vessels on the anterior surface of the iris peripherally and it is possible to trace these for a short distance into the juncture between the cornea and the iris in the adhesion. The anterior surface of the iris is covered by a definite vascular membrane. The blood vessels are most numerous in the sphincter and peripheral regions of the iris. There are advanced

cystoid or hydroptic degeneration of the pigment epithelium of the iris and a low degree of ectropion uveae. Pigment on the anterior lens capsule indicates that posterior synechiae were present. Calcified drusen appear at the ora serrata. The choroid is not remarkable but the ciliary body shows considerable atrophy. The ciliary processes show hyalinization. The retina shows hemorrhages in the nerve fiber and outer plexiform layers, edema and loss of normal architecture at the macula, engorged and sclerotic vessels, and hyaline coagula around the macula. There is an area of retinal separation about the disc. On the nasal side the pigment epithelium does not extend to the disc margin, and on the temporal side all the layers of the retina extend out over the nerve. The optic disc is cupped and the lamina cribrosa is depressed.

O.D.: *Gross:* Soft eye measuring 23 by 23 by 22 mm. There is a small corneal ulcer slightly off center and thickening at the limbus. The eye is opened between the horizontal and vertical planes. An opaque exudate fills the anterior chamber. The lens is opaque and the vitreous is cloudy. There is a threadlike adhesion from the raised disc to the vitreous. The optic nerve is too short for cross section. *Microscopic:* The epithelial layer and Bowman's membrane are absent (some sections) over a purulent corneal ulcer. Purulent exudate fills the anterior chamber and infiltrates the iris. Hemorrhage is present in the anterior chamber and around the pupillary margin of the iris. There are peripheral anterior synechiae of the typical glaucoma type. Very few blood vessels are seen at the juncture of the iris and cornea, but there are a few on the peripheral portions of the iris central to the anterior synechiae. There is a vascular membrane on the anterior surface of the iris, vascularization of the pupillary portion over the spincter region being the most prominent. There are ectropion uveae and marked hydroptic degeneration of the iris pigment epithelium. Pigment on the anterior lens capsule indicates that posterior synechiae were present. There are edema and hyalinization of the ciliary processes. The ciliary body and choroid are atrophic. There is a little chronic inflammatory cell infiltration in the uveal tract. The retina shows reduction of ganglion cells and atrophy, and gliosis of the nerve fiber layer. There are small serous exudates in, and microcystic degeneration of the outer plexiform layer, and rarefaction of the inner nuclear layer in the macular region. Organizing inflammatory and hemorrhagic exudate extends from the optic disc into the vitreous chamber and has proliferated both on the inner surface of the retina and between the retina and underlying choroid. An apparent vascular occlusion in the optic disc is believed to be an artifact. The lamina cribrosa is depressed and the optic nerve is atrophic. There is chronic inflammatory cell infiltration of the episclera.

CASE 3. E. H. F., a woman, 59 years old, had known for three years that she had glaucoma. The increased tension was controlled with eserine until November 8, 1941, when she had an attack of acute glaucoma in the right eye. The tension of this eye had never been controlled since. The eye had given pain more or less since this attack. The patient was under the care of her local physician for hypertension but had never known of the presence of diabetes.

The *eye examination* revealed a vision of O.D. light perception, and O.S. moving shadows. The intraocular pressure was O.D. 90 mm. (Schiøtz) and O.S. 20 mm. Hg. Slitlamp examination

showed the right cornea to be edematous, but there was no evidence of anterior uveal disease. The iris of the right eye showed new-formed, fine blood vessels on its anterior surface. These vessels were outside the pigment border and largely confined to the sphincter area. There were a few larger radiating vessels from this marginal plexus which went to the base of the iris and disappeared behind the limbus. The pupil was slightly dilated and fixed. No fundus details were seen through the edematous cornea. Transillumination was negative for intraocular tumor.

The left eye was negative externally but the fundus examination showed scattered punctate retinal hemorrhages, moderate retinal arteriolar sclerosis, and in and about the central area were scattered lipoid exudates.

Gonioscopic examination. The right eye showed complete anterior synechiae so that none of the angle markings were visible. There were clumps of new-formed vessels on the anterior iris surface peripherally which were not seen on external examination. These extended up onto the posterior surface of the cornea. The left eye showed normal angle markings with no clumps of new-formed vessels visible. There were no synechiae.

General examination. Generalized arteriosclerosis. Heart slightly enlarged. Blood pressure 185/110.

Laboratory examinations. Fasting blood sugar 170 mg. percent. Urine showed 4+ sugar and 1+ albumen.

Diagnoses. O.D., glaucoma (chronic incompensated), rubeosis iridis diabetica. O.S., retinitis hemorrhagica, arteriosclerosis (retinal). Diabetes mellitus. Hypertension.

Course. Intensive miotics and retrobulbar mecholyl did not reduce the tension of the right eye below 75 mm. Hg (Schiøtz). The pupil was constricted and the ruby-red coloration of the iris lost due to the marked vasoconstriction of the new-formed vessels on the anterior iris surface. The right eye was enucleated by Dr. E. W. Campbell of Toledo, Ohio, and sent to the Army Medical Museum.

Pathologic examination. O.D., Army Medical Museum accession number 78450. *Gross:* Moderately firm eye coated with hemorrhage, measuring 24 by 24 by 25 mm. The cornea is opaque, the limbus is thickened. The eye is opened, presumably in the horizontal plane. The vitreous is cloudy and the lens is opaque. Numerous areas of retinal hemorrhage are noted. The sclera is thin. The optic nerve is too short for independent section. *Microscopic:* Hemorrhagic exudate extends over the cornea on one side. The corneal epithelium is thin. There is a little hemorrhagic exudate in the anterior chamber. There are peripheral anterior and marginal posterior synechiae and ectropion uveae. The anterior synechia does not entirely cover the trabecular fibers. There is no noticeable vascularity of the juncture between the iris and trabecular fibers. A vascular membrane is present on the anterior surface of the iris. The new-formed blood vessels are especially noticeable over the sphincter and peripheral portions of the iris. The iris pigment epithelium shows hydroptic degeneration of a slight degree. The ciliary processes are hyalinized. The choroid is somewhat thin, and there are occasional early excrescences on Bruch's membrane. The retina shows cystic degeneration at the ora serrata, reduction of ganglion cells, and atrophy of the nerve-fiber layer. The inner nuclear layer is thin. There is edema of the outer plexiform layer in the macular region. Retinal vascular changes are slight. There is a little serous exudate beneath the retina on the nasal

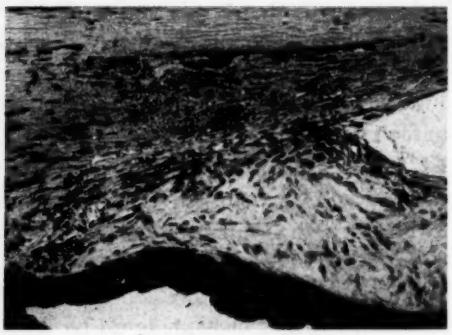

Fig. 10

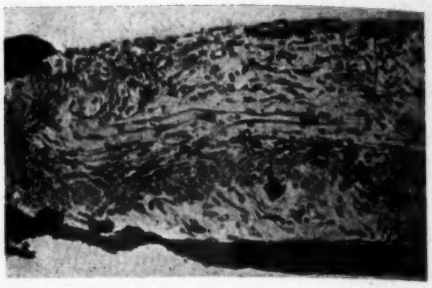

Fig. 11

Fig. 12

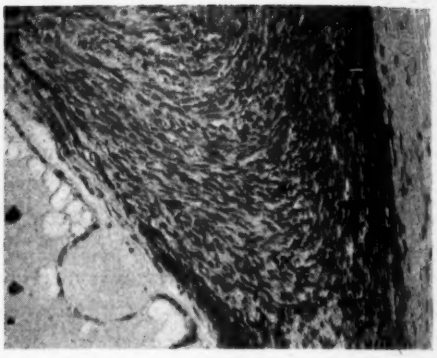

Fig. 13

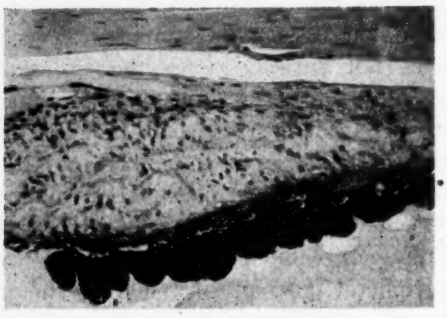

Fig. 14

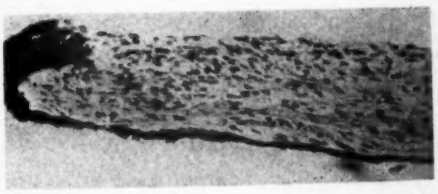

Fig. 15

Fig. 16

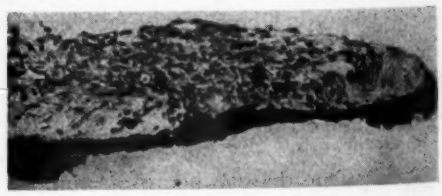

Fig. 17

side. Occasional small hemorrhages are seen in the outer plexiform layer. A vascular membrane covers the optic disc and adjacent retina. The lamina cribrosa is depressed.

For comparison, there is presented the same clinical picture in eyes from two nondiabetic patients in the two following cases.

CASE 4. A. R., a women aged 61 years, had noted progressive visual loss in the left eye for five years. The eye was blind in two years. There was no inflammation nor pain until three weeks previous to examination, when the eye became very painful and inflamed. There were no symptoms referable to the right eye. General health was asymptomatic.

The *eye examination* revealed a vision of O.D. 6/6, and O.S. nil. The intraocular pressure (Schiøtz) was 22 mm. in the right eye and 90 mm. Hg in the left eye. The external and fundus examinations of the right eye were normal. The left eye showed generalized injection of the globe. The cornea was edematous to such an extent that the fundus could not be seen. Transillumination was negative for evidence of intraocular tumor. The slitlamp showed no evidence of anterior uveal disease. The pupil was slightly dilated and fixed. About the pupillary margin there was a ring of new-formed blood vessels on the surface of the iris, giving this sphincter portion of the iris a reddish hue. These new-formed vessels were very fine and individually could be seen only with magnification. Extending from this nearly diffuse ring of vessels to the base of the iris were several larger vessels on the iris surface. These latter vessels to some extent anastomosed with one another. The radiating vessels ended either behind the limbus or in small clumps of fine new-formed vessels on the peripheral iris surface.

Gonioscopic examination. The right eye showed normal angle markings and no new-formed vessels. The left eye showed complete obliteration of the filtration angle from anterior synechiae. New-formed blood vesseds, both fine and coarse, were seen on the synechiae up to the point of adhesion with the corneal surface.

General examination. Blood pressure 180/110; physical findings otherwise normal.

Laboratory examination. Blood Kahn

Figs. 10-17 (Fralick).

Fig. 10. Case 3, right eye. Photomicrograph showing glaucomatous anterior-root synechia not entirely covering the corneo scleral trabeculum. Blood vessels not conspicuous in the scar.

Fig. 11. Case 3, right eye. Photomicrograph showing vascular membrane on anterior iris surface most marked in the sphincter region. Ectropion uveae is marked.

Fig. 12. Case 3, right eye. Photomicrograph showing vascular membrane on the surface of the optic disc and retina.

Fig. 13. Case 4, left eye. Photomicrograph showing malignant melanoma, Callender-spindle cell, subtype B, arising in the choroid.

Fig. 14. Case 4, left eye. Photomicrograph showing glaucomatous peripheral-root synechia without blood vessels' being a feature of the scar.

Fig. 15. Case 4, left eye. Photomicrograph showing vascularized inflammatory membrane on the anterior iris surface causing extropion uveae. New-formed blood vessels prominent in sphincter and basal portions of anterior iris surface.

Fig. 16. Case 5, right eye. Photomicrograph showing peripheral glaucomatous anterior-root synechia without evidence of blood vessels as a prominent feature of the scar.

Fig. 17. Case 5, right eye. Photomicrograph showing new-formed blood vessels on the anterior iris surface at the sphincter region. There was no evidence of membrane formation on the iris surface in this case.

negative; urine showed no albumen nor sugar. Glucose tolerance test:

	mg. %	Urine
Fasting	76	negative
First hour	108	negative
Second hour	117	negative
Third hour	95	negative
Fourth hour	79	negative

Diagnoses. O.S., glaucoma (absolute); arterial hypertension. Rubeosis iridis.

Course. Intensive miotic therapy and 15 mg. retrobulbar mecholyl had no appreciable effect on lowering the intraocular pressure. The left eye was enucleated and sent to the Army Medical Museum.

Pathologic examination. O.S., Army Medical Museum accession number 75310. *Gross:* Firm eye coated with hemorrhage measuring 25 by 23 by 25 mm. The cornea is clouded and thickened. The eye is opened in the horizontal plane. The retina is detached, and behind it are firm transclucent gelatinous exudates and a mushroom-shaped, deeply pigmented growth. The tumor mass measures 9 by 12 by 12 mm., and extends from a point midway between the optic disc and the equator to a point a few millimeters above the equator. The iris adheres to the anterior surface of the lens. *Microscopic:* Arising in the choroid just posterior to the equator is an irregularly pigmented mushroom-shaped tumor that has broken through Bruch's membrane and invaded the retina. Extrabulbar extension is not seen. Thin-walled blood spaces are abundant in the deeply pigmented portion of the tumor. The tumor cells are spindle shaped with oval nucleolated nuclei. A Wilder reticulum stain shows an argyrophil fiber content of more than 50 percent. Tumor type—Malignant melanoma, Callender-spindle cell, subtype B, choroid. Serous exudate occupies the anterior chamber. The iris is atrophic and shows anterior and posterior synechiae and ectropion uveae. A few thin-walled blood vessels are seen in the membrane on the anterior surface of the iris especially in the sphincter region. (I believe that the vessels on the anterior iris surface which gave the ruby coloration to the iris about the pupil would have been more easily seen microscopically if adrenalin had not been instilled accidentally at the time of operation. Adrenalin compounds cause the rubeosis to disappear grossly.) The ciliary processes are hyalinized. There is lymphocytic infiltration of the choroid, particularly anterior to the tumor, and there is vascular engorgement posterior to it. Numerous colloid excrescences are present on Bruch's membrane. The retina is detached with serous exudate and pigment-laden phagocytes beneath it. It is adherent over the tumor, contains serous exudates, and is cystically degenerated and gliosed. Atrophic and degenerative changes are present throughout. The nerve head is invaginated, the optic disc is cupped, and the lamina cribrosa is depressed. There is perivascular lymphocytic infiltration of episcleral and orbital vessels.

CASE 5. W. F., a man aged 53 years, while feeding a printing press six weeks previously noted sudden loss of vision in the right eye. There was no inflammation nor pain until four weeks later, when the right eye became inflamed and painful. General health had always been good aside from a coronary occlusion two years before and a goitre operation seven years previously.

The *eye examination* revealed a vision O.D. of light perception, and O.S. 6/12. The intraocular pressure (Schiøtz) was O.D. 90 mm., and O.S. 23 mm. Hg. The right eye showed generalized injection. The slitlamp examination revealed keratitic precipitates on the posterior surface of the cornea. The cornea was edematous

to a slight degree. The pupil was dilated and fixed. Just outside the pupillary pigment border of the iris was a somewhat dense new formation of fine capillaries surrounding the pupil, giving the iris in the sphincter region a reddish hue. From this plexus of blood vessels extended straight or diagonally radiating vessels to smaller peripheral plexuses, some of which seemed to take part in the anterior-root synechiae. The basal anterior synechiae were very broad since they were seen through the cornea especially down and nasally. The optic disc showed cupping and atrophy. The retinal veins were full but only slightly tortuous. The retina appeared atrophic and presented innumerable hemorrhages throughout. The arteries showed moderate arteriosclerosis. The external and fundus examinations of the left eye were essentially negative.

Gonioscopic examination. The right eye presented complete anterior-root synechiae. There were foci of fine new-formed blood vessels on the anterior synechiae, the vessels in places reached the cornea and disappeared into the iris tissue. The left eye presented a normal filtration angle with no new formations of iris vessels.

General examination. Blood pressure 115/75; general physical examination normal.

Laboratory examination. Blood Kahn negative. Fasting blood sugar 91 mg. percent. Urine showed no sugar nor albumen.

Diagnoses. O.D., glaucoma (secondary). Occlusion central retinal vein. Retinitis hemorrhagica. Retinal atrophy. Rubeosis iridis.

Course. Intensive miotic therapy and retrobulbar injection of 15 mg. of mecholyl did not reduce the tension in the right eye. Adrenalin was instilled in the right eye, causing blanching of the rubeotic vessels of the iris, and the entire globe became white. The right eye was enucleated and sent to the Army Medical Museum.

Pathologic examination. O.D., Army Medical Museum accession number 83612. *Gross:* The specimen consists of a firm eye measuring 23 by 25 by 24 mm. The cornea is clear; the pupil is dilated. The eye is opened in the horizontal plane. The disc is slightly cupped and the lens is opaque. *Microscopic:* There are peripheral anterior and marginal posterior synechiae. There are no conspicuous increases in the blood vessels at the juncture of the iris and the posterior corneal surfaces. There is atrophy of the iris and vascularization of the pupillary zone. Only an occasional vessel is seen on the iris surface at the site of the anterior synechiae. No inflammatory membrane is noted on the anterior iris surface. The ciliary body is atrophic and the processes are somewhat hyalinized. There are multiple small colloid excrescences on Bruch's membrane. Multiple small retinal hemorrhages involve the nerve fiber, outer plexiform, and intervening layers. The retina has undergone atrophic changes, and in the macular region loss of ganglion cells, rods and cones, and of normal architecture is apparent. A little plastic exudate extends forward from the depressed optic disc into the vitreous chamber. Occlusion of the central vein is not seen in longitudinal nor in cross section. Vascular changes are not striking.

Summary and Conclusions

Four eyes in diabetics and two eyes in nondiabetics, all showing rubeosis iridis, were examined clinically and pathologically in an attempt to confirm or deny Fehrmann's contention that a differential diagnosis is possible between the two groups. Contrary to his findings in comparing the diabetic with the nondiabetic eyes, the writer could note no definite difference upon slitlamp examination in the

TABLE 1

DATA ON 32 CASES OF RUBEOSIS IRIDIS DIABETICA

Author	Year of Report	Cases	Rubeotic Eye O.D.	Rubeotic Eye O.S.	Age	Sex	General Medical Status	Glaucoma	Response to Medicine or Surgery	Assoc. Fundus Findings	Remarks
Salus, R.	1928	1	x	x	56	M	Diabetes Hypertension	O.U.	Miotics, No Cyclodialysis, No	Hem. retinopathy, High myopia	
		2	x	x	64	M	Diabetes	O.U.	Miotics, No	Hem. retinopathy	
		3	x	x	75	M	Diabetes	O.U.	Miotics, No	Arteriosclerosis	
Axenfeld, Th.	1929	1	?	?	?	?	Diabetes	Yes	?	Hem. retinopathy	
Arruga, H.	1932	1	?	?	?	?	Diabetes	Yes	?	?	Absol. glaucoma
		2	?	?	?	?	Diabetes	Yes	?	?	Absol. glaucoma
		3	?	?	?	?	Diabetes	?	Iridetcomy, No	?	Diabetic iritis expulsive hem. after surgery
		4	?	?	?	?	Diabetes	?	?	?	Diabetic iritis
Gil, R. R.	1933	1	x	x	?	?	Diabetes Hypertension	O.U.	?	Hem. retinopathy	
Waldstein, E.	1934	1	?	?	47	F	Diabetes Hypertension Syphilis	Yes	?	Not visible	Absol. glaucoma in rubeotic eye
		2	?	?	68	F	Diabetes Hypertension	Yes	?	?	Absol. glaucoma in rubeotic eye. Hem., Retinopathy other eye
Villani, G.[15]	1934	1	?	?	?	?	Diabetes	Yes	?	?	Diabetec iritis
v. Sallmann, L.	1935	1	?	?	64	M	Diabetes Hypertension Renal insuff.	No	?	Hem. retinopathy, arteriosclerosis	Hyaline protuberance at pupil border
	1935	1	x		62	M	Diabetes	O.U.	Miotics, No Trephining, No	Hem. retinopathy, O.D.	Absol. glaucoma, O.S.
Motolese, A.		2	x		51	M	Diabetes	O.U.	?	Vit. hemorrhage, O.D.	Absol. glaucoma, O.S.
		3	x		60	?	Diabetes	O.S.	?	Hem. retinopathy, O.D.	Absol. glaucoma, O.S.
Gallino, J. H.	1936	1	x	x	64	M	Diabetes	O.U.	Trephining O.S., No	Hem. retinopathy	Absol. glaucoma, O.D. Quiet iritis, O.S., later glaucomatous
Lawrence, R. D., and Levy, A. H.	1936	1		x	49	M	Arteriosclerosis Diabetes Peri. neuritis	O.U.	Miotics, No Trephining, No	Hem. retinopathy	
Kurz, O.	1937	1	x	x	29	M	Diabetes Hypertension Acromegaly	O.U.	Miotics, No Iridencl., O.D., No Trephining, O.S. No.	Not visible, O.D. Hem. retinopathy, O.S.	Gonioscopic exam.
		2	x	x	66	F	Diabetes Hypertension Renal insuff.	O.D.	Miotics, No	Not visible, O.D. Hem. retinopathy, O.S.	Gonioscopic exam. Absol. glaucoma, O.D. Path. report, O.D.

TABLE 1—*Continued*

Author	Year of Report	Cases	Rubeotic Eye O.D.	Rubeotic Eye O.S.	Age	Sex	General Medical Status	Glaucoma	Response to Medicine or Surgery	Assoc. Fundus Findings	Remarks
Grandi, G.[16]	1938	1		x	69	M	Diabetes Hypertension	O.S.	Miotics, No	Hem. retinopathy	O.D. normal eye
Favaloro, G.	1938	1	?	?	?	?	Diabetes Hypertension	Yes	?	?	Absolute glaucoma One eye Path. report
		2	?	?	?	?	Diabetes Hypertension	Yes	?	?	Absolute glaucoma one eye Path. report
Fehrmann, H.	1939	1	x		69	F	Diabetes Hypertension	O.D.	Miotics, No	Not visible, O.D. Hem. retinopathy, O.S.	Absol. glaucoma, O.D.
		2		x	61	F	Diabetes Hypertension	O.U.	Miotics, No Paracentesis, No	Not visible, O.S. Hem. retinopathy, O.D.	Absol. glaucoma, O.S.
		3	x	x	59	F	Diabetes Hypertension	O.U.	Miotics, No Trephining, No Sclerotomy with vit. coag., No	Hem. retinopathy, O.D. Not visible, O.S.	Path. report, O.U.
Wegner[17]	1939	1	x	x	?	?	Diabetes	O.U.	Miotics, No Surgery, No	?	
		2	x	x	?	?	Diabetes	No	?	Hem. retinopathy, O.U.	Intracap. cataract extr., O.U., successful
Alaya Haedo, A.[18]	1941	1		x	77	F	Diabetes	O.U.	Miotics, No	Hem. retinopathy	Post. synechia Severe iritis Iris atrophy Absol. glaucoma, O.S.
Sugar, H. S.	1942	1	x	x	69	M	Diabetes	O.U.	Miotics, No Trephining, No	Hem. retinopathy Arteriosclerosis	O.D. enucleated, Army Med. Museum #64143
		2	x	x	?	?	Diabetes	O.U.	?	?	Gonioscopic exam.
		3	x		49	F	Diabetes	O.D.	?	Hem. retinopathy, O.S. Not visible, O.D.	
Fralick, F. B.	1943	1	x		61	M	Diabetes Hypertension Renal insuff.	O.U.	Miotics, No	Hem. retinopathy, O.S. Not visible, O.D.	O.D. enucleated. Army Med. Museum #73483
		2	x	x	34	F	Diabetes Hypertension Chr. gl. nephritis	O.U.	Miotics, No	Hem. retinopathy, O.D. Not visible, O.S.	Ulcerative keratitis and uveitis from tonometry, O.D. O.U. enucleated. Army Med. Museum #75587
		3	x		59	F	Diabetes Hypertension	O.U.	Miotics, No	Hem. retinopathy, O.S. Not visible, O.D.	O.D. enucleated. Army Med. Museum #78450

size or the disposition of the new-formed vessels on the anterior iris surface. Response to miotic therapy was absent in both groups. Both groups complained of intolerable pain to the degree that enucleation was required. A varying degree of iris atrophy was seen in the eyes examined, and yet the rubeotic vessels were still visible in all cases. This could be explained on the basis that the degree of iris atrophy was not sufficient in the diabetic individuals to cause the disappearance of these new-formed vessels. The glaucomatous scar in the filtration angle was essentially the same. The presence of a vascular adhesion between the iris and trabeculum or cornea was not a feature in the eyes of the diabetics studied. Dense tissue predominated in both groups. Unlike Fehrmann's findings, those of the writer showed the new-formed vessels to run in a layer of connective tissue attached to the anterior limiting layer in all eyes except in case 5, where no diabetes was found. There were new-vessel formations in and on the papilla and retina of two rubeotic eyes (cases 2 and 3) in diabetics and no such changes in the nondiabetics. This, however, is not a consistent finding in diabetics with rubeosis, since two of the eyes herewith reported in diabetics did not show it.

Rubeosis iridis has thus been observed in patients showing rather varied pathologic conditions. One was a young severe diabetic with hypertension and extensive kidney damage; two cases were in more elderly diabetics, both having hypertension. It was seen in two nondiabetics, one having a hypertension and an intraocular malignant melanoma, and the other showing only what was diagnosed clinically as an old occlusion of the central retinal vein. In all of the cases presented herewith, the only common feature was the obvious circulatory disturbance to the degree that rubeosis iridis and hemorrhagic glaucoma developed. The writer, therefore, cannot support the contention that rubeosis iridis is a manifestation of an ocular syndrome seen in its true form only in diabetics. It is his belief that, given the right pathologic vascular supply to the eyeball, metabolic abnormalities will be established to promote a low-grade iritis with new-vessel formation and secondary peripheral-root synechiae, resulting eventually in hemorrhagic glaucoma.

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References

[1] Salus, R. Rubeosis iridis diabetica, eine bisher unbekannte diabetische Irisveränderung. Med. Klin., 1928, v. 24, pp. 256-258.
[2] Waite, J. H., and Beetham, W. P. Visual mechanism in diabetes mellitus; comparative study 2,002 diabetics. New England Jour. Med., 1935, v. 212, Feb. 28, p. 367; March 7, p. 429.
[3] Gil, R. R. Soc. Arg. de Opt., 1933 (article not obtainable in this country).
[4] v. Sallmann, L. Glasige Erhebungen am Pupillarsaum bei Rubeosis iridis diabetica (Salus). Zeit. f. Augenh., 1934, v. 85, pp. 262-263.
[5] Motolese, A. Il segnacolo di Salus nel diabete oculare. Atti Congr. Soc. Oftalm. ital., 1936, v. 33, pp. 439-444. (Article not obtainable in this country. Abst. Zentrabl. f. d. ges. Ophth., 1936, v. 37, p. 249.)
[6] Gallino, J. A. Rubeosis iridica. Arch. de oft. de Buenos Aires, 1936, v. 11, pp. 39-42.
[7] Fehrmann, H. Ueber Rubeosis iridis diabetica und ihre allgemein-medizinische Bedeutung. Mit anatomischem Befund. Arch. f. Ophth., 1939, v. 140, pp. 354-371.
[8] Axenfeld, Th. Rubeosis iridis diabetica. Klin. M. f. Augenh., 1929, v. 83, p. 334.
[9] Arruga, H. Diabetes ocular. Arch. de oft. Hispano-amer., 1932, v. 32, pp. 356-367.
[10] Waldstein, E. Rubeosis diabetica irides (Salus). Arch. f. Ophth., 1934, v. 69, pp. 419-420.
[11] Lawrence, R. D., and Levy, A. H. Vascularization of iris and cornea in diabetes. Brit. Jour. Ophth., 1936, v. 20, pp. 198-201.
[12] Kurz, O. Zur Rubeosis iridis diabetica. Arch. f. Augenh., 1937, v. 110, pp. 284-302.

[9] Favaloro, G. Rubeosis iridis diabetica e glaucoma anteriore. Schweiz. Med. Woch., 1939, v. 69, pp. 1107-1108.
[10] Sugar, H. S. Place of hemorrhagic glaucoma in etiologic classification of glaucoma. Arch. of Ophth., 1942, v. 28, pp. 587-598.
[11] Villani, G. Biomicroscopia dell' occhio diabetico. Ann. di Ottal. e Clin. Ocul., 1934, v. 62, pp. 881-909.
[12] Grandi, G. Contributo allo studio della "rubeosis iridis" diabetica. Boll. d'Ocul., 1938, v. 17, pp. 484-491.
[13] Wegner. Ueber Rubeosis iridis diabetica. Klin. M. f. Augenh., 1939, v. 102, pp. 569.
[14] Ayala Haedo, A. Un caso de rubeosis iridica. Anal. de Oft., 1941, v. 3, pp. 177-179.

OPHTHALMOSCOPY AND THE DIAGNOSIS OF HUMAN ILLNESS*

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Edward Jackson (1856-1942), one of the greatest of American ophthalmologists, lived in Denver but belonged to the United States, for he travelled over the entire country, spreading the gospel of medical preparedness. Early in his career, he graced the Chair of Ophthalmology in the Philadelphia Polyclinic and School for Graduates in Medicine, and later as professor of ophthalmology brought renown and fame to the University of Colorado.

He had an unusual talent as an organizer, for, not only did he institute the Ophthalmic Section of the College of Physicians of Philadelphia, play a leading part in the founding of the American Board for Ophthalmic Examinations, which was the first and the model for all American certification boards, but in addition to these monumental achievements, he with Dr. Bane and Dr. Black started the Denver Ophthalmological Society, and later the Colorado Ophthalmological Society with its world-renowned summer course of intensive lectures and demonstrations. Unique in concept, this has served as the stimulus to the founders of the many courses subsequently established elsewhere.

His qualities of leadership were demonstrated when he was chairman of the Section of Ophthalmology of the American Medical Association, president of the Academy of Ophthalmology and Otolaryngology, and president of the American Ophthalmological Society. In further testimony of his professional attainments, he was awarded the Lucien Howe Medal of the American Ophthalmological Society and the Leslie Dana Medal for conspicuous achievement in the field of preventable blindness.

Dr. Jackson was a prolific writer. More than 650 papers and addresses, as well as several textbooks, are evidence of his industry and the wide range of a brilliant mind. He made several original discoveries, and his work on skiascopy will always remain a classic.

When editor of the American Journal of Ophthalmology, the Ophthalmic Year Book, and Ophthalmic Literature, he reached a world audience.

Edward Jackson was a remarkable teacher. Endowed with a retentive memory and an alert, inquisitive mind, he recorded his observations based on reading and personal experiences in a most

* Colorado Ophthalmological Society Jackson Memorial Lecture. The lecture was illustrated with 100 slides; but because of the difficulty of reproducing photographs during the war, the illustrations are omitted.

impressive and convincing manner. Few ophthalmologists have ever ranked with Jackson the discusser.

The study of the life of Dr. Jackson, and his good works, will influence all who practice the healing art. I am, therefore, deeply sensible of the honor conferred upon me to inaugurate the Colorado Ophthalmological Society Edward Jackson Memorial Lectures, a memorial to a great scientist, a world-renowned ophthalmologist, an inspiring teacher, an erudite editor, a sympathetic humanitarian, and a wise counselor beloved by all who knew him.

Because of the many facts disclosed by ophthalmoscopy, this presentation is limited to a few selected groups. It is well known that there is a similarity between the fundus vessels and those of other parts of the body, and for that reason the inspection of the fundus supplies information not secured by any other method of examination.

Sudden closure of an artery leads to immediate partial or complete loss of function, which is either transitory or permanent, depending upon the nature of the local blood supply and the part of the body involved.

In the abrupt closure of the central retinal artery, the portion of the retina supplied by this vessel becomes pale, and, after turning white, the color gradually returns leaving two permanent signs—white, narrow, threadlike arteries and a white atrophic optic disc. When closure is caused by an embolus, there is no free retinal blood. The visual loss is irremediable and unaltered by medical or surgical intervention. I am convinced that when recovery is reported, the poor sight was the result of a spasm of the arteries and not the plugging of a vessel. To the internist, the patient with an embolus presents a problem, especially if there is no valvular heart disease or other evident source of the obstruction. Most often the primary cause is not discovered, although endocarditic vegetations, fragments from a venous thrombus, or from an infected uterus, lung, or other organ may be the origin.

Immediate cessation of arterial blood shows as an interrupted blood stream with spaces between the cells and a slow propulsive pulsation of short excursion. Because the choroid shows through the thinnest part of the retina, the macular region remains colored, yellow, orange, or red. This so-called "cherry-red spot" is at first small, gradually enlarges, and often terminates in fine granules. The size of this area is, therefore, of considerable medico-legal value, for if the patient says he has just lost his vision and a large cherry spot is present, he is in error.

Frequently, patients are subjected to long and costly examinations to discover the cause of blindness in one eye, occasionally both, and not infrequently only a partial loss of one. Careful scrutiny of the retinal arteries will often confirm the diagnosis of sudden artery closure, and the impossibility of restoring vision. If the blindness is of spastic origin, the alterations in the caliber of the arteries are often visible but not always. The actual embolus has been seen and in branch block photographed.

Considerable time and energy have been spent on the interpretation of the sudden artery closure. Some competent clinicians believe the occlusion is the terminal stage of endarteritis, and we can readily agree when streak hemorrhages are found in the superficial retina. This differentiation seems to be borne out in clinical cases but has not been confirmed pathologically. When the physician thinks of these changes as occurring in the brain, for instance, he can understand the symptoms more clearly and forecast the end result with greater accuracy. Parentheti-

cally, it must be understood that the retinal vessels do not always reflect the state of the cerebral circulation.

In contrast to artery closure is vein occlusion, wherein the blood is retained within the eye, and the veins become distended with much or little bleeding in, on, or above the retina. The typical picture is well known; the disc outline is lost, the immense veins lie in the edematous blood-filled retina, and the central vein or branch is plugged.

The clinical course of closure is best studied in branch-vein block where, in the beginning, thin blood follows the retinal fibers in their arcuate distribution. The hemorrhage becomes denser, then whitish areas appear, gradually both blood and the white spots are absorbed as new vessels form the compensatory circulation. The closed vessels may become white lines or scarcely visible.

Total central-retinal-vein thrombus may terminate in one of three ways, complete resolution, organization of scar tissure, or glaucoma. The first two are similar to the general body terminations, and even the increased ocular tension, hemorrhagic glaucoma, may have its counterpart in the great, expanding swellings of cerebral-vessel thrombosis. The danger of a secondary destructive glaucoma is ever present. When the intraocular pressure is once elevated in thrombosis of the central retinal vein, it rarely, if ever, subsides, and usually causes an intolerable constant pain, which can be relieved only by enucleation. Organization is more common than complete resolution. Branch block rarely causes glaucoma, but it must be remembered that glaucoma may cause hemorrhage, and the differentiations between hemorrhagic glaucoma and thrombosis is an ophthalmologic problem. The vein closure may be from an embolus or the result of an endophlebitis.

Much has been written regarding arterio- and arteriolarsclerosis. The ophthalmoscopic signs are not so clear cut as the discussions and the drawings suggest. It is essential to remember that arteriosclerosis and hypertension are not the same, for arteriosclerosis may be present with normal or even theoretically subnormal blood pressure. Incidentally, I heartily approve of any measures which the internists may promulgate to teach the public the truth about blood pressure, its interpretation, and real significance, for such knowledge will decrease the so-called hypertensive neuroses on one hand and on the other make those in real need of medical supervision seek a physician and follow his common-sense instructions.

In speaking about arteriosclerosis, it must be understood that vein compression, where the stiff artery presses the underlying vein or elevates the overlying one, is of significance only when the other signs of arteriosclerosis are present. Physiologically normal arteries may dent normal veins. Textbooks continue to stress the importance of twisting of the arteries as they cross the veins. This, I believe—and this opinion is based on photographic evidence—is much overrated and calls for a critical review. When the sclerosis is partial, white plaques may be found in the vessel wall; when more extensive, the wall may be white; and when extreme, the wall is widened to a broad, white band. The appearance depends upon the cause of the arteriosclerosis, as, for example, syphilitic vessels may be much more defined than those resulting from age and those from hyperpiesia may lie between the two and be either partial, disseminated, or general. Each case must be studied as an individual and the special alterations observed. Generalized arteriosclerosis gives a distinctive pattern of white arterial tree with a pale, or white, optic disc.

The sclerosis of choroidal vessels is a

favorable type for study, for the individual vessels in every layer can be isolated. Cases of sclerosis of both arteries and veins are found.

The close associations of prolonged hypertension and arteriosclerosis are recognized. There are, however, many degrees of hyperpiesia not separable into stages. They are too uncertain for that, nevertheless are demonstrable as progressive from mild to severe. A study of the patients operated upon for the relief of hypertension is enlightening. The reports of the fundus changes fail to show any correlation between the retinal pattern and the need for operation. At the present time, I do not advise sympathetic-system operations, for I am unconvinced of their value.

Clinicians must devote more time to the early diagnosis of hypertension. No region offers a better field for investigation than the fundus, where the earliest change may be an isolated, whitish-gray cloud in the superficial retina, the so-called cotton-wool exudate. This is always suggestive, and in this day of universal blood-pressure determination there is no excuse for overlooking its significance. Next in frequency are retinal hemorrhages of the superficial, striate type. Edema of the retina is an early and important change, and the constant need of appraising its increase or decrease is ever present, for when it is extreme all fundus details are indistinct, when localized to the nerve-head there may be a nasal side elevation or a complete papilledema so great as to suggest a serious, expanding brain lesion.

One should never forget that when a patient known to have had a comparatively negative fundus shows fresh changes, localized edema, or hemorrhages, these new signs should be interpeted as evidence of a beginning breakdown. When dark-brown or red granular hemorrhages develop in the deep retina, the danger to life is acute and calls for the immediate consultation with the family. It has long been recognized that as time passes the retinal edema subsides; this must not be incorrectly interpreted as an evidence of improvement. The course of hypertension is one of interrupted or continuous progress. Many patients, especially women, have been seen for more than 20 years before any hemorrhage appeared and in many the systolic pressure was always 200 or higher.

More attention must be given to the signs of beginning decompensation. A single retinal hemorrhage may be the signal of approaching death and, if disregarded, danger lies ahead. The extensive exudates and the papilledema are more often recognized because of their grossness.

The ophthalmologist refers hypertensives to the internist with the knowledge that only by the coöperation of the patient can the best results be obtained. At times the situation is hopeless from the beginning, either because the disease is too far advanced or the patient so pessimistic that he will make no attempt to survive. The war is exacting an ever higher and higher toll of hypertensives because of the worries and anxieties coincident with the disruptions of life, and the excessive physical and mental exertion. Incidentally, a not unusual early sign of hypertension is unilateral exophthalmos.

When considering the fundus changes resulting from nephritis due consideration must be paid to both arteriosclerosis and hypertension, for often it is difficult to separate the signs of one from those of the other. This is particularly true in cases of malignant hypertension with terminal kidney changes. When a patient whose fundus had shown no gross evidence of disease returns complaining of decreased sight, the fresh changes may be

so striking as to warrant a serious prognosis. Often such patients make no complaints about their eyes and yet retinal hemorrhages and exudates may be so numerous that one wonders why they have not appreciated their visual defects. The severe retinitis and neuroretinitis is familiar to ophthalmologists because it has been taught in all medical schools. At times a high N.P.N. is the only clinical evidence of the cause of delicate macular radiations. These disappear when correctly treated. The favorable cases are in marked contrast to those of massive exudates and hemorrhages, where the damage is not only irreparable but also irreversible and progressive. When first examined the retina may be edematous. As the edema subsides a macular star is formed; this is gradually absorbed but frequently the patient dies of uremia or cardio-vascular disease before it completely disappears. The understanding of the life cycle of the star is essential to accurate prognosis.

No fundus reflects the skin color more strikingly than does the red fundus in the fat, florid patient, nor the pale fundus in the nephritic with anemia. The importance of basing the prognosis on the underlying cause rather than on the disappearance of edema and exudate was photographically recorded in a young women with nephritis. All the fundus land marks were at first obscured by the extreme retinal edema, exudates, and waxy star. Immediately before death the edema disappeared and only a few isolated exudates suggested the former star.

The retinitis of pregnancy, although suggestively similar to other nephritic forms, is, however, often preceded by signs which are easily overlooked. The alert obstetrician knows that the first ophthalmic sign of danger is a spasm of one or more retinal arteries with transitory obscuration of vision. When the spasms increase in frequency or duration, or both, a competent ophthalmologist must be consulted, for, if the patient is allowed to continue her pregnancy to term, a severe retinitis may develop, leaving a permanent pigmentary scarring or an optic atrophy; or a progressive hypertension may be initiated with papilledema and visual reduction, causing a severe curtailment in all physical efforts. The fundus picture of an acute pregnancy retinitis is the same as that found in any acute nephritis.

A fundus pattern somewhat like nephritis appears in traumatic retinal angiopathy, and is due to head injury, or chest or spine compression. The actual cause of the changes is unknown. Fat emboli have been suggested but not proved to be the activating agent. While speaking of the rare it is appropriate to say a word about angiomatosis retinae, Lindau's disease, because of the general as well as local manifestations. The characteristic fundus shows immense, tortuous veins and arteries with one or more angiomas into which the twisting artery can be traced and from which the vein can be followed. This is a familial disease, with brain cysts resulting from the small angioma. The picture, distinctive and once seen never forgotten, is of much interest to internists, neurologists, neurosurgeons and ophthalmologists.

Retinal angiomas may be very small and numerous, or large and single. Occasionally, a congenital anomaly shows dark aneurysmal angiomas like great bunches of purple grapes.

There are few conditions which cause more differences of opinion than does diabetes with retinal changes. The ophthalmologist sees extensive alterations and refers the patient to the internist with a note stating the diagnosis as retinitis in diabetes.

The internist reports that the sugar

level is normal and the diabetes is under control. The retinal signs change but rarely completely disappear. Perhaps the situation is hopeless but the number of patients, the functional loss, and the subsequent great mental upset call for a concentrated effort to solve the problem of their cure. To assist in the solution of the difficulty it is necessary to have a clear concept of what the retinal changes look like. The earliest signs are isolated, minute, round hemorrhages, or pinpoint exudates, or a combination of the two. In the cases of longer duration larger hemorrhages and larger exudates are present. The hemorrhages are frequently of the streak type, and the yellowish white exudates are widely dispersed in the posterior pole or in and about the macula. Frequently, these are thick masses, at other times isolated plaques similar to the lace crown of the so-called retinitis circinata. It must be thoroughly understood that there is no pathognomonic fundus pattern of diabetes, for all of the changes can be duplicated in arteriosclerosis, and even lipaemia retinalis may result from high cholesterol.

Sometimes, as for instance in resolving thrombosis, the small, hard, yellow exudates and scattered hemorrhages without marked retinal-vessel alterations are suggestive of diabetes and call for the exclusion of hyperglycemia as the first step in establishing the etiology. The retinitis in diabetes has a persistency which distresses all who care for it. Occasionally, large fundus hemorrhages become entirely absorbed, but more often they become organized as sheets of retinitis proliferans. The usual case of diabetes shows a rather constant change in the size and location of the exudates and hemorrhages. A critical analysis of 200 diabetic retinitis cases studied photographically, and several of them serially for a considerable time, seemed to prove that the hemorrhages are not the forerunner of the exudates and, further, that in all probability the hard, yellowish-white exudates are not secondary to hemorrhages and, further, that the deep retinal hemorrhages do not become white specks.

The retinal exudates and hemorrhages seem to bear no relation to the efficacy of the diabetic treatment, for we have seen them in the so-called mild diabetes easily controlled by diet and others regulated with insulin. The retinitis may be present before any treatment is started, and in other cases, even when everything from the internist's standpoint is going nicely, fresh hemorrhages and exudates appear as the older ones lessen or disappear. The venous circulation is now under the spotlight of special study. The fundus changes in diabetics show a marked tendency to variation when no particular care or attention is given as well as when the patient is under the most approved scientific controls. Insulin does not increase the retinitis.

The imperative need of greater coöperation between internists and all interested in the eradication of diabetes is the result of several intercorrelated factors which can only be mentioned in this short clinical résumé. First, the introduction of insulin. The life expectancy of the juvenile diabetic has been considerably prolonged, and he is carried into adult life. Second, the relegation of arteriosclerosis as the cause of the fundus picture to a comparatively unimportant position. Third, the more competent and regular fundus examination of diabetics. Fourth, the seeming and doubtless very real increase in the retinal disease. Fifth, the almost complete lack of control once the retinal lesions have become fixed. This depressing fact is constantly borne in upon us, although occasionally the retina becomes clear and the exudates disappear.

Sixth, the longer the patient has diabetes the more he is predisposed to the retinitis. Therefore, juveniles are most liable to severe, invaliding visual disturbances. This emphasizes the well-known fact that many patients under seemingly perfect sugar control develop a progressive retinitis.

Finally, no treatment seems to retard or remove the evidence of retinitis. Some very competent observers believe without clinical support or experimental evidence that insulin induces it. Perhaps experiments with alloxan will supply the missing information and suggest the cure.

Tuberculosis is so familiar to you who live in this region of unusual good health that little need be said regarding it. Hemorrhage from a retinal artery may become absorbed and leave no trace. Tubercles may enlarge, new ones form and coalesce. In some patients hemorrhages are prominent and may disappear or form scars, or an expanding lesion or lesions, or a retinitis-proliferans sheet or veil. A solitary tubercle is most commonly in the macular area.

During the acute stage the vitreous is cloudy with a peculiar luminosity which makes penetration difficult, and photographs disappointing. Clinically, this seems to be very distinctive; in fact, a sign of clinical value. The tubercles of the acute miliary form are observed practically only in the terminal stages of the general disease. Choroidal tuberculosis has a tendency to recur as soft, gray, ill-defined masses which contract and finally heal. There are as many grades and types of tubercles in the eye as elsewhere in the body. It is especially interesting to follow cases similar to those so well described by Jackson and Finoff, where the tubercles lie in apposition to the vessels.

An evening could be devoted to the fundus changes caused by syphilis. It is conceded that there are two major subdivisions of involvement, the vascular and the neurologic, and that rarely do the two mix. This theory seems to hold in ophthalmology, where, if a patient has a choroiditis, he never develops a primary optic atrophy.

The vascular changes are small choroidal spots, often with a faintly pigmented border, well dispersed about the posterior pole. The graphic writers of other days spoke of this as a pepper and salt fundus. The grosser choroidal inflammations leave large or small, many or few pigmented scars, not absolutely diagnostic but suggestive of syphilis. Between these two are groups of medium-sized, round, heavily pigmented areas in the equatorial or peripheral regions.

Neurologic signs are optic neuritis with marked loss of vision and an elevated disc, and primary optic atrophy with sharply demarcated disc and progressive loss of visual field, ending in bilateral atrophy and blindness. Sometimes a child is infected, as, for instance, by a wet nurse. The optic atrophy is progressive. And, finally, a gumma may form in the optic nerve causing a pronounced swelling of the disc which eventually subsides, leaving a large, white scar.

The systematic blood states like leukemia, pernicious anemia, and polycythemia vera present, at times, extensive and suggestive hemorrhages and exudates which may be the first evidence of the approaching termination. Incidentally, it is time that the medical profession keeps blood-state tragedies out of the daily press, and that when a disease like acute lymphatic leukemia is under treatment the futility of transfusions be appreciated, so that valuable blood plasma may be saved for the Armed Forces instead of being wasted.

Because of the widespread interest and unwarranted optimism regarding night-blindness, attention is called to four

types. The classical, well-recognized, fairly common one is retinitis pigmentosa, an hereditary disease characterized early in life by impaired night vision. The loss is progressive until the patient becomes blind in the late decades of life. In this disease the fundus shows an equatorial zone of branching, pigmented cells, and a narrowing of the arteries and the veins leading to an optic atrophy. Nothing has ever checked the disease.

Closely allied to it is a childhood night-blindness without pigment, but white dots cover the fundus—retinitis punctata albescens. In advanced life, there is a superimposed pigmentation similar to that found in retinitis pigmentosa. There is also a form, nyctalopia, without pigment or white spots.

A number of patients with myopia are night-blind, and a careful inspection shows that the choroid is thin, suggesting the fourth group, choroideremia, which is a progressive dissolution of the choroid, eventually leaving only small islands of functioning choroid in the macular region and about the disc. Some syphilitics develop night-blindness and have a choroiditis which may be ameliorated but not cured.

The time has arrived when the medical profession should arise to contest the unfounded claims of the publicity seekers who arouse unfounded hopes of cure and lead the disappointed in their rush to the charlatans.

No talk on fundus lesions would be complete without reference to papilledema, often called choked disc. It is advisable to disregard most of the textbooks and think of papilledema in the strict sense, an edema of the nervehead. In its earliest stages there is an increase in the translucency of the nerve fibers, obviously for anatomic reasons, first observed where the fibers are most numerous, in the nasal portion of the disc. As the edema increases, more and more of the fibers swell, and as a result they surround the central excavation. This cup is retained even when secondary exudate and hemorrhages obscure the disc margin. Often it is recognized only by careful stereoscopic examination and photographs, and for that reason has not been given its proper position in the diagnosis of papilledema.

Time, the duration of the pressure, plays an important role in the individual variations for, other things being equal, the longer the process the greater the disc changes. An inspection of the nervehead in prolonged intracranial pressure will readily confirm this statement. Other elements enter into the production of choked disc, and in this brief account mere mention of them must suffice. In the course of some acute mastoiditis cases the edema of the disc may be of considerable degree and lead the uninitiated into a panic of reoperation. Usually, the condition is transitory and quickly subsides. The disc is of the smooth, rounded type, with few or no hemorrhages in contrast to the papilledema of the sinus thrombosis, where hemorrhages are both early and prominent. Similar in gross appearance is the papilledema from orbital abscess, orbital cellulitis, ethmoiditis, sphenoiditis, or sinus thrombosis. The swelling is often unequal, there being more on the side of the greater compression, if and when both sides are involved.

The wet brain of syphilis causes disc swelling of variable degrees, and the papilledema of hyperpiesia may be so extreme as to call for the most discriminating analysis of all the physical signs and symptoms, including X rays and air injections before the final diagnosis of high blood pressure is made. This is at times a very difficult task, for brain tumor may be present in a patient with hypertension, and unless operated upon the termination

is fatal. The usual hypertensive choked disc is a smooth, rounded swelling, varying in color from yellow to water-soaked gray. This is in contrast to the choke of thrombosis of the central vein, where immense veins and extensive retinal hemorrhages are dominant.

Brain tumors are the major cause of choked disc, and the physician of today is ever alert and always studies the ocular fundus in any patient with headache. Too much stress cannot be laid on this essential procedure to prevent some patient from being operated upon for nonexistent sinusitis while some others, labeled neuropsychopathic, will receive the benefit of modern neuro-surgery. Several years ago, Parker reported on the difference in degree of disc swelling and said that it was greater in the eye with the lower intraocular pressure. This may have some bearing on the cases of frontal-lobe tumor, where one disc is swollen and the other atrophic, the Foster Kennedy syndrome. An arachnoiditis causes papilledema, and, when of traumatic origin, a crown of blood surrounds the elevated disc. The hemorrhage may even flood the retina. The error of confusing optic neuritis with papilledema persists, and yet few observers will frankly state that the classical signs and symptoms need revision. The disc may be greatly swollen in what proves to be a neuritis, and the reverse, little swelling, found in a papilledema. All reference to the diagnostic importance of the degree of disc swelling should be based on the practical understanding of the process. Textbooks say that up to 2 diopters it is optic neuritis; when greater, papilledema. A fairly safe clinical rule is to think of neuritis when reduced vision is the dominant symptom and the visual fields and the disc changes confirm the impression. In choked disc the average patient complains of general symptoms such as headache, nausea, and vertigo rather than loss of vision, and only the ophthalmoscopic examination discloses the swollen disc. Much can be done and will be in the near future to lessen the confusion that leads to delay in diagnosis and postponement of corrective treatment. Enough has been said to elicit interest in segregating the pressures from the inflammations, which include disseminated sclerosis and acute myelitis.

In closing, a word to those especially concerned with treatment of patients in advanced life. Geriatrics is not a specialty. All who practice medicine appreciate that there is a wide discrepancy between chronologic age and tissue maturity. The subject is fascinating, but we can refer to only one of the age tragedies, senile macular degeneration. The patient complains of difficulty in reading, may drift about and buy several pairs of glasses before the macular lesion is discovered. This is at first a small central, retinal or choroidal hemorrhage, then an edema of the retina followed by cellular infiltration and an expanding ring of superficial and deep blood. It may be years before the scars causing the central scotoma and impaired central vision become stationary. The patient is unable to read, becomes very apprehensive, and unless told that he will never go blind as a result of the disease, may become despondent. Therefore, my closing message is to understand and explain senile macular degeneration as well as the other innumerable fundus changes, a few of which have been presented for your review.

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A DISCUSSION OF OCULAR MALINGERING IN THE ARMED SERVICES

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A discussion on malingering in the Armed Services is not satisfactory until a definition for the term is agreed upon. The one given by Balser[1] is adequate: "Malingering is a conscious design or effort on the part of a serviceman to escape service in the Armed Forces by assuming a physical or somatic illness or by magnifying consciously any organic illness which in itself is not a basis for a discharge from military service." The first recorded definition, as published in Groves Dictionary in 1785 is "A military term for one who under pretense of sickness evades his duty." For the purpose of this discussion, the term will be confined to military life and not include civilian deceptions such as the claiming of illness or injury for the purpose of obtaining a compensation in civil life. The writer believes that the term should be reserved to indicate feigning of the serious sort, principally reserved for feigning to attempt to avoid all military duty, to avoid combatant or other hazardous service, or to obtain a discharge from the military service; and he agrees with Waud[2] that the terms "goldbricking" or "soldiering" and other less severe terms should be used for minor conscious feints to avoid duty or work which are very common in military life; the intention to avoid these duties in itself is not punishable. The half-hearted attempt of inductees in the preliminary examinations when not persisted in, should hardly be called malingering, as when a draftee, upon being asked to read as far down on the chart as he can see, says that he has poor vision in one eye and reads only to 20/100, but if urged will soon read the 20/20 line. Malingering, then, as a term should be reserved for the persistent, conscious, willful design and effort on the part of the man to tell and demonstrate his simulated physical or mental defect rather than weakly to mention that he has this condition. The malingerer is fixed in carrying out his purpose to a result.

Malingering must be clearly differentiated from other simulative manifestations. As Brussel and Hitch[3] point out, it is conscious and excludes the phenomena of the psychoneurotic, particularly of the hysterical and anxiety neurotics whose symptomatology is the unconscious ego requirement finding externalization. Carpenter[4] states that it is difficult for many medical officers to accept the fact that malingering and psychoneuroses are distinct clinical entities; the treatment for one is useless for the other. Psychoneurosis is an actual illness. The malingerer lies, the other tells what he believes to be the truth, although it may be true that neither wants to return to duty. Though Grinker and Spiegel[5] say that the greatest problem associated with malingering is the ready conclusion by many medical officers that mild neurotic symptoms and true conversion phenomena can be simulated. It is true that some psychoneurotics exaggerate their symptoms more or less unconsciously to gain their ends, which makes it difficult to differentiate where neurosis ends and malingering starts. The crucial differential point between malingering and a psychoneurosis is that malingering is conscious and a psychoneurosis is unconscious. Some malingerers, as Rosenberg[6] asserts, have a constitutional psychopathic personality, but, on the other hand, some are cool and calculating and seem to have no evidence of psychopathic

personality other than a lack of conscience. Many are below average intelligence.

In my experience of 18 months at the Connecticut induction center, the incidence of ocular malingering was fairly high before Pearl Harbor, averaging about 7 percent in selectees examined, but it dropped off very markedly when war was declared, probably to 2 or 3 percent. In a large basic training center where 500 to 1,400 newly arrived trainees were medically processed a day we found the incidence of ocular malingering to be less than 0.5 percent. Agatston[7] says that in routine army-induction examinations it was between 0.5 and 3 percent. Waud[2] asserts that it is most common among selectees during the first year of service, new recruits, and among those who have been assigned to the guardhouse, or among those who have undergone disciplinary action. Grinker and Spiegel[5] saw only one or two cases in Tunisia. Brussel and Hitch,[3] at the Fort Dix Station Hospital, found that of all cases referred for neuropsychiatric consultations 7 percent were diagnosed as malingerers. Statistics of malingering, like all other things medical, may vary greatly when taken by two men examining the same group. One physician may include only the true, persistent, conscious simulator, another the half-hearted attempt to deceive, and even the exaggeration of illnesses and defects that most psychoneurotics are prone to exhibit. Again the experience of another observer may be only with picked combat troops.

The cause of malingering is inherent in all of us. Gainer[8] says that "evidence of malingering is exhibited very early in life, making it seem almost an innate characteristic of man." Bowers[9] points out that many soldiers have been inducted into the service against their will or to their financial, educational, or social detriment. These men consciously or unconsciously grasp at any possible physical ailment that may improve their present situation. This was particularly true of the selectees inducted before the war, when the reason for compulsory military service had not yet crystallized and any method of avoiding service was condoned by families, friends, and even in some instances by public officials. Once war had been declared, malingering to avoid military service became an unpatriotic and cowardly offense and one not committed by good citizens. There are only three aims in true military malingering, as Agatston[7] points out; namely, to avoid all military service, to obtain limited or perhaps noncombatant status; or to obtain a discharge from the Army with or without compensation. However, by men in exhausted states, after long, unpleasant, and dangerous military duty, it is sometimes used to obtain temporary rest, recreation, and good food. In this instance it is questionable whether the malingering is part of a psychoneurosis or not. I do not agree with Brussel and Hitch,[3] who say that malingering is unquestionably a form of inborn constitutional psychopathic inferiority, although Grinker and Speigel[5] think that the basis of malingering is usually a highly neurotic background. Usually, as Miller[10] says, the difference between a malingerer and the man who goes sick with feigned or exaggerated symptoms for small things, is that the latter is satisfied to be given a chance to escape from a false position without undue loss of self-respect. This latter class is the group which passes on into hysteria frequently, if not recognized and reprimanded. In viewing malingering, the cause and the time of occurrence should be fully considered. For instance, combat troops or flying personnel may refuse to go back

into action, others may feign illness or injury to avoid returning, and still others may have a true conversion hysteria, depending upon the moral and mental stability of the individual. The first instance is the brazen but honest individual, the second is the underhanded and dishonest man, but neither has neurotic symptoms and usually little feeling of self-condemnation, because of his own rationalization. As Grinker and Spiegel[5] point out, these soldiers have simply not adapted their ideals to the current military environment and have little conscience about their conduct. They behave as if they have done their share and the rest is the responsibility of someone else. This is often the expressed attitude of many previously brave and successful fliers. I saw a flying officer who had returned from many missions over Germany, and who on being given the examination for flying claimed just poor enough vision in both eyes to avoid further flying combat duty. On being detected, he simply stated that he felt that he had enough combat duty and was lucky to return alive. He felt that someone else should take his place. The more brazen type is illustrated by the case of a bombardier who, when he was sent to the hospital for a simple operative correction of an extraocular muscle imbalance, refused to have the operation performed because if his muscle balance was corrected, he would return to flying duty. This he did not wish, because he said that he had sufficient combat and chose to remain within the continental limits of the United States. He signed a statement to that effect. Apparently, refusal to return to duty or "partial" malingering is more commonly found in this war than conversion hysteria such as was found in World War I, which Strecker[11] believes may have been due to the relatively few ground troops engaged. It is probably also due to the mobility of the present warfare.

Detection of malingering, in general, depends upon the alertness and experience of the examiner. After working for some time, particularly in induction examinations, one feels that he can sense the malingerer as soon as he comes into the room. Most malingerers enter the examination room with an unusual attitude; it may be bellicose, aggressive, or it may be with a great deal of timidity. The gait and manner in which the patient handles himself usually arouse suspicion. Simulation[12] is always in keeping with the extent of the knowledge possessed by the individual regarding the particular disease from which he pretends to suffer. It is always impossible for the healthy person to feign the entire picture of the disease he has selected, thus the examiner can usually detect omissions, discrepancies, and contradictions. Cozen[13] and Grinker and Spiegel[5] suggest the use of morphine or hypnotic drugs to uncover simulation and to secure confession.

In detecting ocular malingering, each case should be treated as an individual problem, because the means of detection that are successful with one man may not work with another. In the preliminary or early military examinations it has been the writer's experience that many men who premeditate malingering are discouraged from it by a somewhat bellicose and aggressive manner on the part of the examiner; and if malingering is attempted, intimidation by threats, ridicule, or sarcasm is often discouraging, at least to the naïve and unpracticed simulator. If the malingering is persisted in, the examinee is best stood to one side; and I believe that the man should stand up while awaiting a more opportune time for lengthier examination. Standing in

one spot for some time under apprehension as to the results of the delayed examination is very exhausting and discouraging to many men. This crude approach does not work and should not be used on the more hardened, intelligent, and experienced malingerer. For men of the latter type who are usually encountered later in military service and who wish to avoid being sent to combat duty, the concealed sympathetic approach is more successful, for it puts the malingerer off his guard and secures better coöperation. A complete history should first be taken, including that of his family, for often psychic disturbances in a parent give a clue to the background of the man's actions. The time of occurrence and believed reason of onset of the claimed disability should be determined. Most psychoneurotics date the disability from some very definite emotional event, whereas the malingerer frequently is vague about the time of onset and its etiology. The protracted examination and prying questions irk the malingerer, but the hysteric eagerly answers all questions. The actual examinations should be made rapidly, and a careful record kept. During the actual examination it is well to have witnesses present with a view to the possibility of later courtmartial. Once sufficient evidence of malingering is secured, ridicule, sarcasm, and an attitude of disbelief may be adopted. This may be injected insidiously but clearly, to let the falsifier know that his simulation has been detected. He may be sent away to return for another examination, when he will sometimes admit his deceit. The element of surprise is sometimes useful; for example, suddenly telling the man he is a liar and asking him the reason. This often unnerves the malingerer, and a confession may be obtained. If possible it is well to have a signed confession; few malingerers, however, will sign an incriminating paper except by intimidation, which would not look well in courtmartial.

In cases of doubt, reports of previous examinations by oculists or optometrists with record of the patient's vision can usually be obtained, for if the patient has deficient vision even in one eye he usually is cognizant of the fact, has sought medical aid at some time, and is frequently wearing glasses. However, too much reliance should not be placed on ocular examinations just prior to induction in the Army, because in some instances the inductee has gone to an oculist and malingered on the examination in the doctor's office to establish evidence of poor vision. There have even been cases in which the physician falsified his report of vision. Many states require a visual examination before an automobile driver's license is issued, and usually their record of vision can be readily obtained from the Motor Vehicle Department. If insurance has been taken out, the insurance company or its local representative may have a record of vision. Many of the larger industrial concerns give preëmployment examinations and will have a record of the man's vision. Knowledge of the previous occupation of the examinee will often throw light on the approximate vision necessary to perform a certain task. Information regarding the patient's vision may also be obtained through the Red Cross, the patient's neighbors, or relatives.

There are six forms of malingering,[2] and these may be divided into positive, in which the man attempts to prove his falsification, or negative, in which he falsely denies history or physical signs of existent disease or injury:

(a) By simulation, the symptoms of an injury or disease which does not exist

are feigned.

(b) By falsification, the signs of the disease are misrepresented.

(c) By false attribution, the cause of the disease is falsified or there is the assignment of an untrue cause to an actually existent disease or injury.

(d) By exaggeration, the signs and/or symptoms of an existent disease or injury are intentionally increased.

(e) The disease or injury is intentionally inflicted by the man himself or by his request and with his knowledge.

(f) Dissimulation is the pretense that a real disease or injury is not present or is less serious than it really is. Or the man may deny the existence of prior injury or disease before coming into the service in order to obtain compensation or discharge. All forms of malingering fall into the aforenamed categories or a combination of them.

Specific tests for detection

A. Visual. It is important, in making most of the visual tests, that the patient should not close either eye during the examination, and a very careful and constant watch must be maintained by the examiner to see that this order is carried out. The more practical tests only are herein described.

1. Claim of partial loss of vision in both eyes. This is the most difficult falsification to prove and is the one most frequently used. It is also the most frequent simulation of the conversion hysteric.

a. The retinoscope and ophthalmoscopic examination will readily establish the approximate refraction of both eyes and the probable visual acuity without glasses. For examination of large groups, ophthalmoscopic examination usually provides sufficient information regarding the refraction. The table prepared by Agatston[7] gives approximate vision for refractive errors without correction.

b. The correction worn in the man's glasses usually gives the approximate refractive error, but occasionally there have been found men who have just obtained glasses with large amounts of correction for the purpose of establishing a record of poor vision without and even with glasses. An emmetropic person, for instance, may wear heavy minus lenses; and, indeed, it is not infrequent to find that the optometric examiner may have prescribed a good deal more minus power than the patient requires.

c. To determine the acuity of vision without glasses, especially in the myopic, a minus lens with a balancing plus lens may delude the patient into believing that he has his correction before his eyes when actually he has the equivalent of plano. This will give the record of vision without glasses.

d. In the army age group there should be little difference between visual acuity for distance and near. The correlation between Jaeger and Snellen type is valuable, or between Snellen type and test objects.

e. The manner of reading the test type may arouse suspicion. If a person can read all the letters on a certain line correctly he can always read a few of the letters on the next smaller line. The malingerer will frequently read without hesitation down the chart to the end of a certain line, then stop and refuse to see any letters on the next line. On the other hand, he may read every letter on the chart with equal hesitancy and effort as if it were just as difficult for him to recognize the 20/200 line as the 20/50. Again, he may deliberately miscall certain letters. The letter "L" hardly looks like any other, an "F" may be called a "P," or "C" an "O," but if "C" is called "T" when other letters on the same line

are read correctly it arouses suspicion.

f. When partial loss of vision of both eyes is claimed, probably the most valuable test is changing the size of the visual angle by testing the individual at varying distances as 20 feet, 30 feet, 10 feet, 5 feet; 10/20, for instance, is the approximate equivalent of 20/40.[15] If careful checks are made with recordings of vision many malingerers will give themselves away because they do not know which line they should see at a given distance. One occasionally sees a man who has been coached for this examination beforehand. A mirror test with special chart in which the letters are reversed is valuable, because frequently the malingerer does not realize that a chart seen in a mirror is the equivalent of twice the distance to the mirror.

g. If much difference in the visual acuity is claimed, the same tests as those for partial loss of vision in one eye only may be used.

h. Negative malingering to enter the armed services or to maintain a certain status must be kept in mind. Squeezing the lids together to make a stenopaeic slit improves vision in cases of refractive error. I have encountered two cases in visual testing in which contact lenses were being worn by commercial airline pilots seeking Air Corps commissions. To my embarrassment, it was not until finger tension of the eyes was taken that this subterfuge was discovered.

2. Partial loss of vision in one eye only. The history of the length of time there had been poor vision in the one eye, history of injury or eye operations are most important. Merely because one eye deviates or has deviated does not necessarily mean that the eye is amblyopic; many squinters have 20/20 vision in both eyes, particularly the true alternators. Exaggeration of slight amblyopia is common.

a. Gradle's test with three polaroid discs.[16] One polaroid disc is placed in the trial frame before each eye with the polarizing axis horizontal. The individual is then asked to read the smallest line of letters on the test chart with both eyes open. While reading, the third polaroid disc which has been inserted before the good eye, is rotated so that the polarizing axis becomes vertical. This rotation of the third disc prevents any passage of light to that eye, so that if the reading of the test chart is continued during this time it is evident that the poor eye is the one being used. If the patient stops reading when the good eye is blotted out by polarization, one may start again one or two lines higher and repeat the procedure to determine which line the man can actually read with his poor eye.

b. Polaroid discs with a projection apparatus.[14] A polaroid disc is set in each side of the trial frame with the axes at right angles to each other. A third disc is placed in a projection apparatus and is rotated so that the reading of the test letters of either is blocked out at will. This has the advantage that the trial frame on the patient is not touched at all during the examination.

c. The Snellen test with colored letters on glass illuminated from behind.[15] A test card of special red and green letters on glass may be used with a red glass before one eye and a green glass before the other. The red letters will be invisible to the eye which has the green glass and vice versa. This also may be done by having letters of different color on paper. Most projection apparatus which project red and green letters can be used as well, or the ordinary duochrome check.

d. Test with trial lenses. The refractive correction is placed in the trial frame before each eye. A high plus lens is then placed in front of each eye. The plus lenses are gradually reduced in strength

but much more rapidly for the allegedly poor eye, so that in a few changes only the refractive correction is before this eye. With each change of lenses the patient is asked to read. When the plus is reduced to the refactive correction of the poor eye the best visual acuity with correction of this eye is obtained because the vision of the good eye is still blurred.

e. The bar-reading test of Cuignet.[15] An object such as ruler or tongue depressor is held vertically between the patient's eyes. The reading material, such as the Jaeger card, is held at about 35 mm. away, so that the whole of any one line cannot be seen with either eye; part of each line being covered by the ruler. The subject is then asked to read the smallest print that he is able to. If he reads an entire line he must be able to see it with both eyes, otherwise the portion of the line read with the poor eye would be blurred.

f. The Bishop-Harmon diaphragm apparatus.[15] A test card with graduated letters is held by the apparatus, which consists of a holder at reading distance with a diaphragm held between the holder and the patient's eyes, so that in looking through the diaphragm the patient sees the left-hand letters on the test card with the right eye, and the right-hand letters with the left eye, which confuses him. The visual acuity of the poor eye is thus determined. The same thing can be done with the phoropter provided by the Army, or with the stereoscope, by removing the partition.

g. The test of reading Snellen chart at varying distances and reading in the mirror can be used as described.

h. Duane[16] describes the test of asking the patient to read aloud rapidly and suddenly placing a 4-degree prism up or down before the poor eye. If the eye is very amblyopic and there is no fusion, there will be no effect, otherwise the confusion resulting from the diplopia will make reading poor or impossible.

i. The Harlan test. A +12D. spherical lens is placed before the good eye and a +6D. lens before the other eye. The examinee is given a Jaeger card to read which is held close enough so he can read the test card with the good eye. The card is then gradually withdrawn and if he continues to read when the print is out of focus for the good eye he must be using the amblyopic eye. The degree of visual acuity in the amblyopic eye can thus be determined.

j. Lasky[17] describes Jackson's cylinder test. Two cylinders are placed at right angles to one another before the normal eye, giving the equivalent of a sphere; the correcting lens is also placed before each eye. The patient is directed to read rapidly and one of the cylinders is slowly rotated, blurring the vision of the good eye. A +2D. sph. and the same minus cylinder with their axes parallel may be used before the good eye.[18] As the axis of one lens is rotated, the vision of the good eye becomes blurred.

k. The stereoscope with reading-test cards is useful, such as Keystone cards or others in which some of the letters or numbers are seen with one eye and some with the other. The Keystone test has the advantage of having the test letters of varying size, so that the acuity of the amblyopic eye can be determined.

l. Bakker, according to Lasky,[17] describes a modification of the colored-letter test. The Snellen chart is illuminated with red, green, or yellow rays from a lamp; the patient is fitted with his corrective lenses. The examiner puts a green glass over the patient's good eye and turns on the green light. The patient finds that he can read with his good eye only. The red glass is then put over the good eye, the red light put on and the patient again reads it with his good eye.

Another red glass is put in front of the good eye and a sodium lamp is turned on, or the green lamp might be turned on and, since the rays are absorbed by the glass, he then reads unknowingly with his bad eye.

m. If the good eye is occluded first and vision of the poor eye is tested, many patients who are simulating will read so many lines from the top, or so many lines from the bottom. If one cuts away one or two lines of the top of the chart so that the top line is 20/70 and adds other lines at the bottom such as 20/10 lines, the patient will often be induced to read the equivalent number of lines of smaller visual angle than he has accustomed himself to and so will admit better vision to that degree.

3. Total loss of vision of both eyes. The history is very important. The onset of the blindness and the manner in which it occurred is asked. Fundus examination may reveal no pathologic change, which immediately excites suspicion.

a. Pupillary reactions are important. Any accommodation-convergence reaction immediately uncovers simulation, but this is difficult to induce in the patient. Reaction to light is possible even though both eyes are blind if the visual fibers are intact to the geniculate body. Usually the pupils are semidilated in blind eyes and do not respond to light.

b. The optokinetic-nystagmus test attributed to Bach[18] causes a horizontal jerky nystagmus when the subject fixates objects that are moving, such as those seen from a moving train. The optokinetoscope is a vertical drum, about 10 inches in diameter, which has alternate black-and-white vertical stripes, each one inch wide. This drum is mounted vertically on a central rod and revolved slowly. The patient is induced to look toward the drum and, if nystagmus results, the patient must have visual fixation in at least one eye. It is important to revolve the drum slowly and to have the instrument at the usual reading distance from the patient.

c. Watching the patient cross a room and his manner of approaching objects, such as a stool or chair placed in his path, is valuable. If he is simulating blindness he will usually avoid the object or rush at it and fall over it with unusal force.

d. Most people who simulate blindness wear dark glasses probably in order that by so doing it is possible to prevent observation of the movement of the eyes behind the glasses. The true amaurotic patient does not wear them as a rule.

e. The induction of instinctive reactions on the part of the person can be used. For instance, if a menacing action is made quickly and unexpectedly in front of the patient, or a very bright light is flashed in his eyes, the normal tendency is to flinch and blink and thus vision is proved.

f. The Schmidt Rempler test.[14] The patient is asked to look at his hands. The actually blind individual will rotate his eyes toward his hands, while the malingerer will look elsewhere purposely.

g. Electro-encephalography[19] has been used. The alpha rays are present in electro-encephalography when the eyes are shut, in blindness, or when there is a uniform light or dark field of vision. They stop when there is enough vision to distinguish large objects. These alpha rays come from the occipital cortex.

4. Total loss of vision of one eye. All of the tests used for amblyopia of one eye can be used with these additions:

a. Pupillary reactions are useful. If the eye is blind the consensual pupillary reaction should be present in the blind eye but absent in the good eye, and the direct reactions will usually be absent in the blind eye but present in the good eye.

b. The Jackson test[15] can be used. A

6-degree prism, base down, is placed before the good eye; the muscle light at the other end of the room is turned on. If two lights are seen, binocular vision is proved.

c. A 10-degree prism, base out, is placed before the blind eye. If there is fixation in this eye and fusion, diplopia will be momentarily induced and the eye will rotate inward to correct it and fuse the two images.

d. A 10-degree prism, base down, is placed before the good eye so that its edge lies horizontally across the center of the pupil while the other eye is occluded. This produces monocular diplopia when the man looks at a distant light. If the prism is then moved upward in front of the good eye and the blind eye is simultaneously uncovered, and diplopia is admitted, there is sight in the blind eye.

e. Strong cylinders[17] of the same strength are placed one before each eye but at right angles to one another. The patient is requested to look at a test light which is flashed on at the other end of the room. If a luminous cross is seen, vision is present in both eyes. Maddox rods can also be used for this.

f. Van Sisley, according to Lasky,[17] makes use of the physiologic blind spots. Three white spots are placed on the tangent screen so that the center spot can be fixated with both eyes and the left-hand spot will fall on the blind spot of the left eye and the right-hand spot will fall on the blind spot of the right eye. If a diaphragm, such as a vertical ruler, is placed between the two eyes just in front of the face, the left blind spot cannot be seen with the right eye and vice versa, so that with both eyes open only the center spot is seen. If the diaphragm is then removed, three spots are seen with both eyes open or if one eye is occluded entirely two spots are seen, the center and the left hand spot with the right eye, and the center and right hand spot with the left eye. The patient can be tricked into giving the wrong answers.

g. The patient may be placed in a dark room and told to close both eyes. The occluder is held in front of one eye or the other, so that the patient cannot tell which eye is covered; and then a narrow beam of light is flashed on the uncovered eye. If light is seen through the lid of the blind eye, vision in that eye is proved.

h. The perimeter may be used in taking a field with both eyes open. If the test object is seen in the area in which the nose occludes or blocks the vision of the good eye, vision is proved in the poor eye, which is the reverse of Cuignet's confrontation test, in which the examiner passes an object across the field of vision of both eyes and the dishonest subject denies having vision in the nasal field of the sound eye.

B. Defects in visual fields. The most common and best-known defect in the visual field in malingering or hysteria is concentric contraction, usually demonstrated by the spiral field in which the visible area on the test apparatus seems to grow smaller as the examination proceeds, so that finally the field is reduced to 5 or 10 degrees from the center, or even less. A false tubular field may also be simulated; and this can be detected by testing the fields of vision at different distances from the tangent screen, in which case the malingerer usually maintains exactly the same-sized field at different distances—for instance, 10 cm. from the center—even though the visual angle has changed. The color fields may be reversed. Most simulated defects in fields are easily detected by the examiner.

C. Night blindness is a not infrequent complaint of men assigned to sentry or other unpleasant duty at night. This symptom is frequently complained of in early basic training, at which time many cases of retinitis pigmentosa or

myopia with retinal degeneration and night blindness are discovered. Kreieleis[20] says that by repeated examinations with the Comberg adaptometer, the malingerer cannot remember his adaptation. The Hecht apparatus can be used even better. The American Optical Company instrument is not so well adapted because it depends on length of time, which is rather easily remembered. The value of Harman's test,[21] using varying-sized colored discs, is questionable. McDonald[22] states that the complaint of poor night vision frequently manifested by poor landings at night is one of the earliest manifestations of an anxiety state in fliers.

D. PHOTOPHOBIA is a frequent complaint in the tropics or semitropics. If it does not disappear with the wearing of dark glasses (in the absence of a visible evidence of pathologic change), it can be assumed to be a manifestation of malingering or psychoneurosis. Many psychoneurotics complain of photophobia, and the wearing of tinted lenses in any individual without adequate reason is an indication of the possibility of a psychoneurotic personality.

E. DEFECTIVE COLOR VISION is rarely simulated and could only be used to relieve a person from flying status. This can be readily discovered by using the American Optical or Ishihara plates or one of the colored-light or -yarn tests. Negative malingering is much more common but can always be detected by these same tests if done properly.

F. EXTRAOCULAR MUSCLE IMBALANCE. The most common complaint of the malingerer on this score is diplopia. There can be no binocular diplopia unless there is a muscle imbalance, either a phoria or a tropia, and unless some degree of fusion is present. Except in the case of paralytic strabismus, any complaint of diplopia should be regarded with suspicion. If the diplopia is of long standing before induction into the Army, it cannot be very annoying. It is important for the examiner to recognize these facts before testing and treating any extraocular-muscle imbalance. We recently saw a case of unilateral congenital fibrosis of the external rectus muscle. The man was not aware of the condition and had no symptoms until it was accidentally discovered in an examination at a nearby station. The examiner evidently thought that since there was a divergent strabismus upon looking in one direction and a convergent strabismus upon looking in another, diplopia must be present, and ordered an occluder for the involved eye. The man was finally sent to the hospital and the actual condition was discovered. The occluder was removed, the condition was explained to the patient, and he was returned to duty. Now he complained of diplopia even though he had no fusion. This man had a psychoneurotic personality originally, but he has since developed a neurotic fixation because of the poor judgment of the medical officer who ordered the occluder.

Nystagmus can occasionally be simulated. Voluntary nystagmus is pendular and may be unilateral or bilateral. The movements are usually rapid and may be in any direction. They are increased on fixation, convergence, and by increasing the palpebral fissure. It disappears by distracting attention or by blurring the vision, such as by placing a +20D. sphere in front of both eyes. I have seen two such cases in the service. It is produced at will and is not associated with any pathologic entity.

G. PTOSIS is occasionally simulated, but it is a difficult simulation to carry out consistently. It is usually adopted by persons of low intelligence and is easily recognized by having someone hold the individual's head firmly and asking the patient to follow a test object as it moves

in all directions of gaze. In true ptosis, the eyes usually elevate although the lids do not, but in false ptosis it is impossible to elevate the eyes without elevating the lids at the same time.

H. LAGOPHTHALMOS AND EXOPHTHALMOS, unilateral or bilateral, can occasionally be produced artificially in talented individuals. But these conditions cannot be maintained voluntarily for long and are soon recognized if nonpathologic.

I. ASTHENOPIA is a frequent complaint of psychoneurotic individuals, particularly if they are doing close work. On the other hand, adequate cause in refractive error, muscular imbalance, or incorrect and inadequate lighting may be discovered. If there is no ocular pathologic change and no other adequate cause can be determined, psychoneurosis or malingering should be suspected. In conjunction with asthenopia headache is a frequent symptom and must be investigated thoroughly before it is waived aside as a simulation. Most simulators of headache are soon detected in actions such as prolonged reading, loud talking, roughhousing, or other boisterous activities which are not well tolerated by one having real headache. A placebo drug may also be given.

J. CILIARY SPASM is occasionally met with in anxiety neurosis or hysteria. I recently saw a man who had a bilateral severe ciliary spasm of 10 or more diopters which was intermittent and seemed to be produced at will without any discoverable cause. On psychiatric consultation there was no other evidence of a psychoneurosis. I never was sure whether the condition was voluntary or not. After the condition had been explained to the soldier he was sent back to duty and has not been heard from since.

K. CONJUNCTIVITIS artificially induced by placing foreign bodies, such as glass and sand or other articles, in the conjunctival sac[23,24] has been frequently described, but apparently rarely seen during this war. Few men are willing to damage their eyes intentionally, because of the high value placed on the organ of sight.

L. VOLUNTARY BLEPHAROSPASM is occasionally seen. It is apt to continue in spite of local anesthetic drops, when a true blepharospasm disappears. Unilateral blepharospasm is not infrequent when diplopia is complained of.

M. INTRAOCULAR DISEASES are almost impossible to simulate. However, exaggeration of the symptoms, such as defective vision, is not uncommon in these cases. The usual tests for defective vision are used. False attribution is occasionally seen when the individual tries to obtain an Army discharge or compensation for nonservice-connected ocular pathology.

Negative malingering is a frequent occurrence, an attempt being made by the examinee to cover up ocular pathology in order to enter the services or to maintain combatant or flying status.

Although the incidence of malingering is not high in this war, it is important that any attempt at it is effectively dealt with in order to discourage it in other examinees. I agree with Farrell and Kaufman[12] that whenever it appears to the examining physician that an individual is endeavoring to escape service by malingering, if otherwise mentally and physically fit, he will be accepted. I also agree with Bowers,[9] who says that the patient's bluff should be called and if he refuses to be a good solider, punishment should be immediate and of a severity in keeping with the nature of the case. I cannot agree with Brussel and Hitch[3] that the malingerer should be prevented from gaining entrance into the Armed Forcs and that should prevention fail he should be detected and eradicated by discharge, and

should be returned to the community whence he originated. This policy if followed through would place a high premium on falsification to the detriment of the honest individual. It is imperative that line officers as well as medical officers be on the lookout for malingerers. If a case is detected and action is taken word soon gets around that malingering does not pay, if the punishment for this crime is sufficiently severe. Even "goldbricking" and other minor feigning of illnesses should be discouraged. But the major form of malingering to avoid military service, to obtain discharge from the service, or to avoid combat should be treated like any other crime, such as stealing. This is not treated as a psychoneurotic disorder, and neither should malingering. Any malingering that succeeds lowers the morale of the whole organization. It would seem that now that we are at war a stricter policy should be adopted, and the individual should be punished with due regard to the gravity of his offense. The medical officer should remember that his job is detection only, that corrective action is the duty of the man's commanding officer. A psychiatric consultation should be obtained on all malingerers, to differentiate between neurosis and malingering, and if courtmartial is ordered it is well that a psychiatrist be present at the trial. Prophylaxis for malingering is even more important and is accomplished by the same means that Strecker[11] advises as prophylaxis for neuropsychiatric disabilities. There is a significant relationship between malingering, war neurosis, and morale in the troops. High morale depends on several local factors in the soldier's environment: 1. Healthy training conditions. 2. Sufficient and good-quality food. 3. Sufficient exercise. 4. Supervised sports, and other diversions. 5. Medical care that inspires confidence. 6. Good relationship between the men and officers. 7. Rigid discipline and drilling, which inspires a sense of group security. 8. Talks to groups of soldiers on the psychologic aspect of fear and its understanding. 9. Most important is a clear perspective and appreciation of the ideology for which the war is being fought and the value to the individual, his family, the nation, and the world of maintaining this ideology.

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References

[1] Balser, Benjamin, Major (MC), A.U.S. Personal communication.
[2] Waud, S. P. Malingering. Milit. Surg., 1942, v. 91, Nov., p. 535.
[3] Brussel, L. F., and Hitch, K. S. The military malingerer. Milit. Surg., 1943, v. 93, July, p. 33.
[4] Carpenter, R. J. Early recognition and treatment of neuropsychiatric conditions in the combat zone. Jour. Amer. Med. Assoc., 1943, v. 123, Nov. 13, p. 705.
[5] Grinker, R. R., and Spiegel, J. P. War neuroses in North Africa, the Tunisian Campaign. New York, Josiah Macy Jr. Foundation, 1943, p. 95.
[6] Rosenberg, S. J. The psychiatric service of an Army Station Hospital. Amer. Jour. Psychiat., 1943, v. 99, May, p. 865.
[7] Agatston, Howard. Ocular malingering. Arch. of Ophth., 1944, v. 31, March, p. 223.
[8] Gainer, J. F. Malingering. Amer. Jour. Med. Jurisprudence, 1939, v. 2, March-April, p. 173. Quoted by Brussel and Hitch.[3]
[9] Bowers, W. F. Hysteria and malingering on the surgical service. Milit. Surg., 1943, v. 92, May, p. 506.
[10] Miller, Emanuel. The neuroses in war. New York, The Macmillan Co., 1943.
[11] Strecker, E. A. War neuroses, Milit. Surg., 1944, v. 94, April, p. 196.
[12] Farrell, M. J., and Kaufman, M. R. A compendium of neuropsychiatry in the Army, Army Med. Bull., 1943, v. 66, April, p. 27.

[13] Cozen, L. N. Malingering among soldiers: Orthopedic aspects, Milit. Surg., 1943, v. 92, June, p. 655.
[14] Sugar, H. S. Malingering in military ophthalmology. Milit. Surg., 1942, v. 91, Sept. p. 314.
[15] Standards of physical examination during mobilization. Mobilization Regulations 1-9, United States War Department, Oct. 15, 1942.
[16] Duane, A. A textbook of ophthalmology. Ed. 8, Philadelphia, J. P. Lippincott Co., 1924.
[17] Lasky, M. A. Simulated blindness. Arch. of Ophth., 1941, v. 25, June, p. 1038.
[18] Snell, A. C. Medicolegal ophthalmology. St. Louis, C. V. Mosby Co., 1940.
[19] Lemere, Fred. Electro-encephalography as a method of distinguishing true from false blindness. Jour. Amer. Med. Assoc., 1942, March 14, p. 884.
[20] Kreieleis, W. Can the presence of night blindness be proved with certainty in case of doubt? Klin. M. f. Augenh., 1940, v. 104, June, p. 663. Reported in Arch. of Ophth., 1943, v. 29, Feb., p. 328.
[21] Harman, N. B. Shamming night blindness. Brit. Med. Jour., 1941, v. 2, Nov. 22, p. 737. Reported in Arch. of Ophth., 1942, v. 28, Aug., p. 352.
[22] McDonald, P. R., Major (MC), A.U.S. Personal communication.
[23] Harding, G. F. Repeated placement of foreign body into the inferior fornix. Arch. of Ophth., 1943, v. 29, March, p. 486.
[24] Duke-Elder, W. S. Textbook of ophthalmology. St. Louis, C. V. Mosby Co., 1938, v. 2, p. 1596.

PATRON SAINTS OF THE EYES: AN OUTLINE*

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Healing through saints in early and medieval Christian centuries transcended that by physicians, who were secondary and enjoyed only scant encouragement when saintly personages could be invoked to cure. Man, animals, and the heavens were set by custom in fixed categories: Man was above the beasts but below the angels; he was foreordained to worship God, but all else had been created to serve man. Dissenters forfeited their rights and privileges and were punished publicly. The Christian martyrs, many of whom became saints, were among these because their professed beliefs differed from those of others in the community.

Lacking the solace of scientific reason, refuge was sought in superficial explanations of terrors of Nature. These developed as narratives that increasingly were employed to diminish the unreasoning fear engendered by abnormal activity of the elements. Thus, naturalistic legends ensued while supernatural legends evolved as stories of the saints.

Miracles. A great variety have been reported in some detail but Brewer questions whether all of those vouched for by the Fathers during the first three centuries of the Christian era should be accepted since by far the great majority of all recorded miracles occurred during that single period of time. Sight has been reported to have been restored to persons of all ages and to both sexes and to those who were born blind as well as to those who had become sightless. Miraculous cures most often apparently were

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achieved by the laying on of hands, the making of the sign of the cross, by prayers or by other words, by an attitude of gaze, by bathing the eyes in water used by the healing one, or by a combination of two or more of these methods. The recipients of the return of vision are anonymous in the main or are identifiable only briefly. Very rarely supernatural powers were invoked to effect blindness in an offender.

Popular faith in miracles, particularly in times of illness, evolved from the intimacy of suffering attendant on the close relationship of the sick and the saints. However, as Pettigrew observed, in part, "... all miraculous cures are of the same description, the disorders are similar, and the effects described are precisely the same. It is faith which works the miracle...." But Le Bec, staunch in his belief that there must be recognized the existence of "a mysterious force emanating from the Holy Eucharist," stated: "Miracles are not made to order." Miracles, in the Christian legends which are as venerable as Christianity itself, instanced the intervention of God in such fashion that intangibles assumed reality: The impious suffered righteous punishments and the devout were rewarded and their prayers were heard. The early Western Church only secondarily and with reluctance supported this faith in miracles and in saints, but its blessing permitted the glorification of the miraculous in ecclesiastical art and indirectly was largely responsible for the biographic portrayal of the saints as we know them at present.

Saints. The term (from the latin, *sancti*, and the Greek, *hagioi*) refers to members of a Christian community but is applied particularly to those who lived in Jerusalem (Dan vii. 18 sqq., et cetera). The deeds and lives of some individuals indicated exceptional possession of piety and spiritual grace, and this character was attributed in natural course especially to those who had suffered martyrdom. This first was expressed in the letter of the Smyrna congregation. Communities kept registers of those Christians worthy of public veneration, and this was permissible only by order or authority of the bishop. These names were recited at the Eucharist. Hutton states: "From these diptychs (lists) came the kalendars, and from the kalendars in later days the martyrologies." And it is from the latter that the legendaries developed.

Christian martyrolatry replaced pagan worship of the dead, but modified pagan *parentalia* became birthday feasts and festivals of the martyrs. Thus, paradoxically, veneration of the saints permitted expression in part, at least, of the basic heathenism which the Church had supplanted. Prayers for saints at eucharistic oblations were transformed into intercessory appeals. Every altar had its relics, and chapels of saints received the sick as once did the temples of Aesculapius. Amulets became a part of the dress, and no important undertaking, personal or communal, was initiated without invoking the aid of appropriate saints. Success usually necessitated a formal expression of gratitude, and recovery from illness after saintly intercession caused the presentation of medical votive offerings to churches, chapels, or altars.

Hagiography. The "depositio martyrum" in the calendar of the Roman chronographer (354 A.D.) is the oldest known calendar, or almanac, dealing with the lives of the saints; however, only the barest biographical facts are recorded and, since these did not satiate the faithful, there developed the hagiographic legend as a literary device to cater to numerous local preferences and mores. These legends entertained as they instructed, edifyingly in religion and morals but, prior to the thirteenth century, they had

been collected only in liturgical manuscripts and differed little from those written from the fourth to the sixth centuries. These Christian legends served originally to epitomize asceticism and martyrdom and to create an apochryphal history of the apostles from the stories of their lives in the Gospel; known facts of genuine martyrologic instances embellished incredible tales for the credulous, and central figures were so interpreted as to leave no doubt of the virtues and joys implicit in the practice of Christian principles. Not infrequently, however, the only historically demonstrable facts in a particular legend are the name of the saint, the fact of canonization, and the date of the festival in question.

The foremost hagiographer, Jacobo da Voragine, the Archbishop of Genoa, portrayed the lives of the saints in his "Legenda aurea." His stories were not new but were arranged in order as in the several calendaria. He constantly moralized under the text of august example, and he was a diligent, uncritical recorder of tradition. As an educator he made available to the many the lore which, in his day, was largely the property of the few with access to monastic lectionaries. His stories were comprehensible to all because of their direct, even coarse, pliant style. Reference so often was made to current moods and beliefs that the work appealed widely to a sorely tried but indefatigably optimistic age. It became the most popular work of the Middle Ages and exerted considerable influence on the arts. It had none of the appearance of the work of an individual; its tone was more that of the accumulated folklore of all Christendom. It provided the average Christian with an escape from the narrow geographic boundaries and the restricted social barriers of his daily existence. And equality of mankind gained a partisan whenever it was learned that the wealthy and the poor knelt as equal supplicants.

Intercessory specialization. Appeals to formerly unknown saints for assistance against certain maladies resulted increasingly in specialization. This refinement is an extension of a constant tendency since earliest antiquity to request special protection for particular bodily parts. Saints as patrons of specific diseases generally were chosen as such because of some appropriate miracle thought to have been performed during the life of that saint, or in some specific detail of martyrdom, or in a peculiarly tonal association of the name with that of the part or of the morbid condition. This association of names, so current among the more humble of the populace, was not to be found in the almost inaccessible, obscurely written, liturgical manuscripts, and it was not until the thirteenth century that Jacobus first integrated them into his "Golden legend." Ecclesiastical art visually portrayed the saints thus popularized and aids in interpretation not only of the supernatural legend with reference to ophthalmology but also, of the associated artistic masterpieces.

Saint Lucy

Those suffering primarily with external diseases of the eyes invoke the aid of Saint Lucy, a virgin and martyr of Syracuse in Italy (Sicily). Historically, it is known that she was born into the nobility in about 283 A.D., of wealthy Christian parents. Her Italian father's early death left her dependent on her devoted Greek mother, Eutychia (or Eutitia). Lucy, as did many other early martyrs, desired to consecrate her chastity to God and worked constantly to devote her anticipated material wealth to the use of the indigent; however, her mother, who held control of the property, did not agree with this noble resolve until after her

chronic, intermittent vaginal bleeding had ceased while praying at the shrine of Saint Agatha in Catania where she had been taken by Lucy (Lucia). Brewer has given the story of this miracle in some detail: Lucy prayed to Saint Agatha to intercede for her mother and, while still in prayer, the saint appeared with heavenly angels and said, "Sister Lucy, why ask of me what you can yourself give unto your mother? Make your petition to God, for be assured if He loves me, He no less loves you also. If He will hearken to my prayers, so will He unto thine. If I am honoured as a saint here in Catanea, you shall be honoured as a saint in Syracuse."

Lucy found her mother restored to health and persuaded her to permit distribution of most of their wealth among the poor; however, the pagan youth to whom she had been unwillingly betrothed objected to this openhandedness and reported her unfavorably as a Christian to Paschasius, the governor of Sicily. She was found guilty and condemned to prostitution but she stood so immovable in the strength of God that even four oxen could not drag her from the spot where she stood (fig. 1). Further tortures and indignities then were forced upon her, but her faith in God still was so unswerving that her death finally was accomplished only when her throat was punctured by a sword. Baring-Gould pointed out: ". . . with Saints . . . when everything else seems ineffectual to hurt them, cold steel breaks the charm." This is depicted in the Predella Panel: Martyrdom of St. Lucy (fig. 2). The symbolism of light as well as her attributes is portrayed by others (figs. 3 and 4).

Saint Lucy's most careful historians mention her blindness as one of her most grievous torments, but there is no documentation concerning the actual loss of her eyes. Mention of the latter does not occur either in her "Acta" or in any of the earliest legends, but early artists expressed her name, Lucia (or *lux*), by placing an emblem of an eye, or eyes, near her in their works. Jameson not infrequently encountered such instances "of the convergence of the image or metaphor into a fact," and it is most probable that from such sources there developed the additional supporting incident or incidents in the history of her life.

Jameson also reports that many references exist with regard to the loss of Saint Lucy's eyes. This apocryphal narrative tendency apparently developed several centuries after her historic martyrdom. It is related, for example, that a young man of her acquaintance in Syracuse, although he expressed his deep love for her in every ardent fashion, found it unrequited. Her eyes had so captivated him that he was unable to think of anything else. Lucy felt not only that her vow of chastity was in danger but she also feared for the safety of her suitor and, bearing in mind the dictum of Christ, she plucked out her offending eyes (the method is not given) and sent them to the young man on a salver. He then, worthily enough and in atonement for the deep injury he had initiated, was converted to Christ and lived thereafter in virtuous chastity. However, it was not ordained that the pure and blessed Lucy should remain sightless; as proof of her courageous piety, her eyes suddenly were restored more pristinely beautiful than before as she knelt one day in prayer.

Saint Lucy, according to the many works dealing with the lives of the saints, is among the most illustrious of the virgin-martyrs and was so honored at Rome in the sixth century. Her feast day is celebrated annually by Latins and Greeks and by many warm-country Catholic peoples on the 13th of December, which

Fig. 1

Fig. 2

Fig. 3

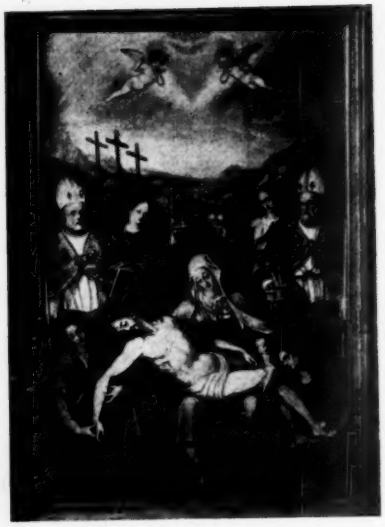

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Fig. 10

Figs. 1-10 (Koch). Patron saints of the eyes.

Fig. 1. Scenes from the "Life of Saint Lucy: A miracle of the saint," by Jacopo Avanzo. Ancient fresco, Oratorio de S. Giorgio, Padua, Italy. (By courtesy of the Frick Art Reference Library.)

Fig. 2. Martyrdom of Saint Lucy; by (attributed to) Domenico Veneziano or, to (?) Pesellino. Predella Panel in Berlin Gallery, Berlin, Germany. (By courtesy of the Frick Art Reference Library.)

Fig. 3. Saint Lucy received into Heaven; by (attributed to) Niccola Grassi. Este-Duomo. (By courtesy of the Frick Art Reference Library.)

Fig. 4. Pieta, with Saints Lucy, Agatha, Petronius, and bishop Saints (who may be Clair or Augustine or both); by Arcangelo Aquilini. (By courtesy of the Frick Art Reference Library.)

Fig. 5. King Gustaf of Sweden and "Lucia" girl at Royal Tennis Club, Stockholm, Sweden, December 13, 1939. (By courtesy of European Picture Service.)

Fig. 6. Saint Odile (to left of mid-center) receives Castle Hohenburg from her father, Duke Eticho I. ("Hortus deliciarum," 12th century.) (By courtesy of Ciba Symposia.)

Fig. 7. Saint Odile (allegorical), with Saint John the Baptist, angel, and chalice; by I. Meckenem. Burlington Mag., 1930, v. 56, April, p. 174. (By courtesy of the New York Public Library.)

Fig. 8. Saint Odile, with eyes on a book (missal). Gothic altar wing, St. Peters, Salzburg, Germany. (By courtesy of the New York Public Library.)

Fig. 9. Martyrdom of Saint Clarus; by Quentin Varin, in Les Andelys, Notre Dame, France. (By courtesy of the Frick Art Reference Library.)

Fig. 10. Saint Clare of Assisi (1194-1253), co-foundress of the Order of Poor Clares. (By courtesy of Mrs. E. T. Dehey.)

also is the festival of Saint Odile. This coincidence has given rise to some confusion. Saint Lucy, in a painting by Albertinelli which hung in the Munich gallery, is recorded in the German catalog as Saint Ottilia; however, the latter was an abbess and, in all devotional pictures, properly is so represented. The 13th of December was a date known throughout the Middle Ages, especially in Western and Central Europe and in the Mediterranean countries, as the night of Saint Lucy, when demons and phantoms roamed the earth spreading illness.

She popularly was believed to spend that night annually dispersing evil spirits and warding off whatever malignancies they were perpetrating. Her feast, even today, is observed nationally in Sweden, a predominantly Lutheran country, when on that date a girl of each family, dressed all in white and wearing a lighted crown of candles, appears at dawn and offers coffee and "Lusia çakes" in honor of the saint who symbolizes the return of the light of day and the bringing of cheer (fig. 5).

Saint Lucy is the principal patron saint of Syracuse as well as of Alife, and she is a minor patroness of Palermo and of Mantua, Italy. She is invoked not only primarily against diseases of the external eyes but against ocular diseases in general as well as the loss of sight. She is believed also to protect against sore throat, epidemic diseases, dysentery, and any type of hemorrhage. The laboring poor, ploughmen, and tillers of the soil venerate her as their patroness. Her festival was celebrated as one of the second rank in England until the Reformation, and no work except tillage was permitted on that day. Swainson mentions in his "Weather folk-lore" with reference to the 13th of December, the day of martyrdom of Saint Lucy: "Lucy light, the shortest day and the longest night." Jacobo da Voragine, introducing his chapter on Santa Lucia, says: "Lucia means light. Now the aspect of light is beautiful for by its very nature it contains all classes. Hence we must understand that St. Lucia possessed the ornament of immaculate virginity; that in her was an outpouring of heavenly love without any impure passions. Her prayers went directly to God, and she passed the whole day in charitable works, without pause and without vexation. Or Lucia also means lucis via, a path of light." Blake writes: "There is a manuscript, written in 1220, preserved in the dome of the Milan Cathedral, and cited by Gottofredo of Bussero, stating that Lucy took her name from 'light.' Cardinal Frederick Borromeo, in the sixteenth century, in his book, "On sacred paintings," mentioned a connection between Saint Lucy and the pagan divinity Lucini, who was also recommended for ocular troubles."

Artists and sculptors, great poets and writers, and even an explorer, have done homage to Saint Lucy and have added to her renown. Santa Lucia, an island in the Lesser Antilles, was discovered on the 13th of December and named by Christopher Columbus in her honor because, it is related, he had been cured of ocular trouble by her intercession; however, de Ybarra does not confirm this, although it is possible that chronic uveitis coexisted with the rheumatism (and not gout) from which Columbus suffered throughout his adult life.

The devout poet, Dante, professed such great devotion for Saint Lucy that he stated in the "Convivio" that he would name one city for Mary and the other for Lucy if he had a total of only two to name. He wept so copiously over Beatrice that Saint Lucy cured him when his eyes were affected. The light, exhilarative joy aroused by thoughts of Saint Lucy is expressed in the Neapolitan Boat Song, "Santa Lucia."

Many artists have portrayed Saint Lucy in many attitudes, media, and in a variety of styles. Details of her martyrdom; her emblems, the cord and eyes; the lamp symbolic of illuminating grace; the two eyes placed on a dish, a salver or on a missal held in her hand or situated nearby; the poniard, dagger, or sword; and the blessed palm of martyrdom are depicted individually or together in the various paintings, sculptures, glasswork, polyptychs, altar pieces, predellas, and bas-reliefs. The earliest works, as well as

those of later centuries, portray her holding a palm as the symbol of her martyred death for the sake of Christianity while the two eyes figure in some fashion more prominently in the later works. She consistently has been endowed in art with the character of celestial light and wisdom. Among those who have thus represented her are Tiepolo (in the Church of the Holy Apostles, Venice), Luca della Robbia (in bas-relief, over the door of the Church of Saint Lucy, Florence), Domenico Veneziano (in an altar piece in the same church), Barroccio, F. Angelico, Luca della Robbia (Church of Santa Maria a Ripa, Empoli, Italy), Carlo Dolce, Giovanni de Spagna, Lello da Velletri, Antonio Riccio, Paramegianino, Bernardino Luini, Antonelle Gaginia, le Perugin, Lodovico Brea, Arcangelo Aquilini, Jacopo Avanzo, Pesellino, Angelico da Fiesole, Benedetto del Ghirlandajo, Niccola Grassi, Pietro Alemanno, Crivelli, Garofalo, Bartolo di Fredi Battilore, Lorenzo Costa, Gabriele Capellini, Domenico Ghirlandajo, and Lorenzo di Niccolo Gerrini.

Saint Odile

The recorded biographies of Saint Odile (Ottilia, Odilia, Otilia, Othilia, Obdulia) are considered by Waite to illustrate the growth of a legend the romance elements of which have been woven about certain other basic facts that appear to him to have been fairly well authenticated historically.

There is in French Alsace a Mount Hohenburg which is said to have been a retreat of Alsacian Celts who protected it by a wall. It became a Roman camp for a time but, in the latter half of the seventh century, Adalric, Duke of Alsace, was in possession of this site on which a castle already had been erected. Adalric (Adalrich, Adalricus, Etic, Ettico, Aticus Etik —*Vatican spelling*), or the Alemannic duke, Eticho I, was an imperious nobleman of his time who owed allegiance to his King, Childeric II, a reputed descendant of Archinould, Duke of Normandy, and a near kinsman of Dagobert the Great. Adalric married Bereshinde (Bereswinda, Berswinde), a relative of Saint Leodégar (Léger). The "Life" of Saint Odile (the "Vita" written in the tenth century), embellished with many legends, makes the claim that she was a niece of this saint. It is stated in the Catholic Encyclopedia that there exists a shorter text contained in a manuscript of the early eleventh century but that "internal evidences point to an original eighth century biography" although these are not specified.

A daughter who was born blind in about 660 A.D. was the first issue of the union of Adalric and Bereshinde. The enraged father lost no time in condemning her to immediate death; however, her mother secretly placed the infant girl in the care of an old female servant. Vision was reputed to have been bestowed upon her during adolescence, and, after parental reconciliation, she became a nun and the abbess of a convent which was actually the Castle of Hohenburg. She lived there for nearly a century and died in sanctity as a monastic saint.

The other recorded details of the narrative of Saint Odile are less well authenticated. She is said to have been transferred by her mother for educational purposes from the care of the old servant to the Convent of Baume-les-Dames, the Mother Superior of which was an aunt of Bereshinde. Despite her blindness she was instructed in learned matters and became a patron of intelligence and of piety although she never had been baptized. It was at this period of her life, when she was somewhere between the ages of 6 and 12 years, that Saint Erhard (Erard, Everard, Erhardt, Eberhard, Herard), a

bishop in the commissariate of Ratisbon, presumably fell into an ecstasy during which he received a call to proceed to Baume in the Rhineland to christen, by divine inspiration, a blind girl who was to be called Odile and who would receive sight with the sacrament. The promised miracle immediately followed baptism and, as she opened her eyes, according to Jacobo da Voragine, Saint Erhard said to her: "May you look at me thus in Eternity, my daughter;" or, according to Waite: "So, my child, may you look at me in the Kingdom of Heaven."

Adalric, shortly after the return of Odile's sight, was informed not only of the existence of a daughter whom he thought dead but, also, of the occurrence of the miracle. Accounts vary with reference to whether Saint Erhard was the purveyor of this news or if her brother, Hugh, had approached his father with the information. It is agreed, however, that Adalric, this unnatural parent, became very angry and not only refused Hugh's request that Odile be permitted to return home but he forbade any mention of her name. Hugh sent for Odile in spite of the parental edict and he was standing with his father on a neighboring small hill when she arrived in a carriage accompanied by a small crowd of local peasants. When Adalric learned the identity of the traveler and the manner of coming to his castle he fell upon Hugh and effected his immediate death. Adalric then turned, however, in immediate remorse to his daughter and, after gazing at her for the first time, became as affectionate as he had been cruel.

Odile came to prefer to live in quarters provided by her father at Obernai. It is inferred that she wished to continue the type of activity for which she had been trained. She lived and worked for several years at Obernai with a few recruited companions who joined her in devotions and charitable works among the poor. Her father, upon her attainment to womanhood, arbitrarily arranged for her marriage to a German duke. Upon learning of this plan she fled, closely pursued, in beggar's clothes across the Rhine and, as she was about to be captured by her father at the Schlossberg near Breiburg in Breisgau, was forced to hide under a rock beneath a cliff face. This opened miraculously to her prayer and gave her refuge. Her father again was profoundly impressed by the evidence of another new miracle when the rock opened to liberate her, with a new healing spring issuing from the fissure. This spring is consecrated and still flows at Odilienberg (Hohenburg) where there is a long vista over the Rhine Valley, Alsace, and Baden. It still is visited by many pilgrims seeking not only the curing waters for their ocular troubles but, also, the intercession of Saint Odile. There also is to be found there a small chapel dedicated to her honor; however, it is not claimed that this is the same chapel that she is said to have had built on the spot in commemoration of the event when the rock gave her sanctuary.

When a reconciliation with her father was effected, consultations ensued, and she opened her heart to him, after which he permitted her to return to the family estates in complete freedom. She then expressed her desire to establish a convent of a community of nuns for the purpose of the literal practicing of the principles of the Gospel. He was prevailed upon to present to her from his various possessions his Castle of Hohenburg, situated behind Obernai. She altered the premises to suit her purposes and converted them into a convent to which Charlemagne granted immunity. This was confirmed on the 9th of March, 837, by Louis the Pious, who also endowed the Foundation. She became the abbess of 100 nuns and

added a great church, in the chapel of which she was buried.

Saint Odile established a rule of life, probably on principles of her own, in her convent, but there exists considerable difference of opinion, according to Waite, with regard to whether this was of her own devising, that of Saint Benedict, or that of Saint Augustine. Pilgrims travelled to the convent in increasing numbers, but the steepness of the mountain was a discouragement and an inconvenience; subsequently, she founded an auxiliary convent at a lower level on the eastern slope of the Mount (fig. 6). This she named Niedermünster and attached an inn, or hospice, to it.

Both her mother and father died in this convent during her long and useful life. She is said to have succeeded in rescuing her father from purgatory by receiving supernatural assurance that her prayers and penances for him had been answered. In about 720, on her deathbed at the age of 103 years, on the 13th of December, which, like that of Saint Lucy, is celebrated as her feast day, she was presented, it is related, with a chalice containing both elements of the Eucharist. She received it into her hands from a radiant angel in the sight of her nuns. It is implied by some authors of the lives of the saints that it was Saint John the Baptist who appeared to her and who also indicated at that time the site and dimensions for a chapel which he wished her to build in her honor. It is believed by others that this is more likely to have occurred at some time prior to that of her death, and this is indicated by the portrayal of Saint Odile and Saint John in an old work of Meckenem (fig. 7). The chalice remained with her after the communion and was placed in Hohenburg in 1546, in which year the abbey was destroyed by fire on the Vigil of the Assumption. The abbey was destroyed and rebuilt several times subsequent to its first destruction. Some believed that the relics of this saint were preserved in spite of these events but the fate of the heaven-sent chalice is unknown.

The cult of Saint Odile grew, and she became the patron saint of Alsace. Hohenburg (Odilienberg), which later was said by the faithful to contain the relics of its first abbess, became a renowned mecca for holy pilgrimages. Saint Odile, who is invoked for ocular affections, usually is represented in ecclesiastical art with two eyes reposing on the pages of a missal, or prayer book, and her vestments are those of an abbess, by which she is readily distinguished from Saint Lucy, to whom is granted the same emblem together with a martyr's palm and who is also commemorated on the same day, the 13th of December (fig. 8). Baring-Gould has observed ambiguously that there may exist some difficulty between recognition and invocation of these two saints by reason of the narrative crediting Odile's miraculous acquisition of eyesight by baptism.

Saint Clair

Saint Clair (Claire, Clarus, Clarius), whose feast is celebrated on the 4th of November, was a priest and martyr of the ninth century. He is invoked, chiefly in northern France, by those afflicted with inflamed eyes. Ophthalmia, according to Gordon, was known as Saint Clair's disease, but the term probably was employed generically rather than specifically. Saint Clair after having been elevated to the priesthood in England went to Normandy and lived as a hermit at Le Vexin (Vernon), in the Diocese of Rouen, adjacent to the Diocese of Beauvais.

There is much repetition of the name Clarus and of its derivatives in the several calendars, almanacs, and dictionaries. This may have been the result of carelessness by earlier compilers, or it may

have been due to the tonal association of names as well as to geographic inaccuracy. The French Benedictine, Usuard (Usuardus), according to the Benedictine Monks of St. Augustine's Abbey, Ramsgate, placed the name of Saint Clair in the Roman Martyrology as of the ninth century. The English Menology, however, gives rather wide limits concerning the time during which he lived covering the period of 666 to 894. There is further confusion concerning actual dates because the Roman Martyrology in its chronological listing mentions a Saint Clarus whose feast is celebrated on the 8th of November and whose epitaph Saint Paulinus is said to have written. This Saint Clarus, who died a few days before his Master in 399, was a priest at Tours, an important community on the main highway to Paris from Nantes and Orleans.

Another Saint Clarus who is said, according to the Benedictine monks of St. Augustine's Abbey, to have been known to have lived and gained local fame in Normandy in the Middle Ages may very well be the Saint Clarus registered in the Roman Martyrology. Baring-Gould does not diminish the investigative difficulties by adding that Saint Clair occasionally is represented as a bishop, thus being mistaken for his namesake, Saint Clarus, a bishop of Mantes, which is a community situated between Paris and Vernon on the River Seine. Nor is it an aid to learn that there is still another Saint Clarus. The latter was an aged pagan priest at Roche-Guyon (upstream from Vernon on the River Seine), and he was converted to Christ by Saint Nicasius of Rouen after the former had been cured of blindness by the latter. The nature of the blindness is not specified, but Clarus later was ordained a priest and suffered a martyr's death (for reasons not recorded) with Saint Pientia of Roche-Guyon. Martyrdom occurred in approximately 311. The feast day of this Saint Clarus is celebrated on the 11th of October. And, lastly, there was a martyred Saint Clarus who was a bishop of Apt in southeastern France. He is the local patron against sore eyes and also the patron saint of tailors. His relics are in the parish church of Apt, where formerly his festival was celebrated on the 2d of January, but he now is honored also at Saint Cannot's Church in Marseille on the 9th of February.

In the interests of clarification some geographic mention should be made of northern France in the valley of the Seine. This is the region where the principal Saint Clair flourished, and this is fairly evident since the various compilers make similar mention of the several communities associated biographically with saints possessing this name. It seems most probable that there existed only one important Saint Clair who was invoked by those afflicted with inflamed or sore eyes, and it is his story that will receive particular attention here. It also may be observed that the name, "Clair," derives from the old French, meaning "clear," which, when usurped as a name for contemporary holy persons gained the further significance of spirituality of grace, gaze, and of mind. It is speculative whether Saint Clair chose his name in France or if he acquired it earlier in England. It was not an uncommon name in the France of his time, but it was not brought to England until the Norman baron, Walter de Bienfaite, of Clair (the treaty town of Clair-sur-Epte), in France, gave the name early in the tenth century to the English town now known as Clare.

Saint Clair was purported to have lived for many years a life of great seclusion and severity, in emulation of the Fathers of the Egyptian Deserts, after he had gone to Normandy from England to live

in the then province of Neustria. He is reputed to have led a hermit's existence near Coutances, south of Cherbourg, after which he became a monk at Maudun. He attempted, as a hermit, to teach true religion by word and precept to those among whom he lived, and he continued to follow these principles throughout his life.

He settled after long wanderings in Le Vexin, either in or near the Diocese of Rouen or that of Beauvais. The story of his martyrdom relates that he lived somewhere in the neighborhood of a lady of rank whose amorous advances he so frequently was compelled to repulse that it became necessary for him to take refuge in the forests in order to avoid revengeful death at the hands of two servants the spurned woman had sent to murder him. It is inferred that his eyes were of such beauty that he unwittingly caused the burgeoning of unrequited love in the unfortunate woman. His repeated flights ultimately, however, did not prevent his eventual beheading (fig. 9; see also fig. 4).

Saint Clair is among the few English saints represented in the famous wall paintings in the chapel in the Venerabile in Rome. His martyrdom is appropriately symbolized, since he is represented as carrying his head with one hand while bashfully covering his eyes with the other as, presumably, was his attitude when the lady cast her admiring glances on him. Although Saint Clair is invoked throughout northern Catholic France by those with diseased eyes, there exists no available record of specific instances of ocular cures effected by his intervention.

It is necessary in connection with Saint Claire to digress briefly with regard to Saint Clare (Claire, Clara, Chiara, Cera) of Assissi, who was a virgin saint and foundress of the Poor Clares. She was born on the 16th of July, 1194, at Assissi, in central Italy, and took the vows of the ascetic life at the age of 18 years. She governed a community of nuns for 40 years, the last 27 of which she lived in illness. Pope Innocent III granted sanction for the privilege of extreme poverty and of living solely on the alms of the beneficent. It is from this custom that her order has ever since borne the title of the "Poor Clares." Her festival is held on the 12th of August, but she is celebrated only locally in Italy and in isolated communities elsewhere as a patroness against sore eyes. No specific instances of miraculous ocular healing are accredited to her; however, she is frequently depicted carrying or holding a lighted lamp (fig. 10).

Saint Augustine

Saint Augustine (Augustin, Aurelius), Confessor and the Bishop of Hippo Regius, was born on the 13th of November, 354, at Tagaste in Numidia. He is included by name in the Canon of the Roman Mass in Gaul and in the Mozarakic Mass of Spain. The Greek Church does not honor him, but he is commemorated in the Russian Church on the 15th of June. His festival is celebrated on the 28th of August, in accordance with the listing in the Roman Martyrology, and the Augustinian's keep his feast day as a double minor of the first class. He is the patron saint of theologians, printers, and brewers, and he is invoked against sore eyes, primarily among the Germanic Catholic States, but medical historians make no specific mention of this.

His impulsive nature as a youth led him, according to the various compilers, into an active life of vice, and it is considered that, in religion, he also went astray; however, from having been Hearer in the Manichaean sect, he ultimately proceeded to Rome and, thence, to Milan to teach rhetoric. The successive study of

Neo-Platonic writings, the summons of Saint Ambrose, and the Epistles of Saint Paul served to bring him nearer to the Church. His conversion is related very graphically in his "Confessions." After his baptism on Easter, in 387, and after a life replete with so many moral and intellectual errors, he began to live the life of a saint. He returned to Africa, was ordained a priest and, then, appointed preacher at the Church of Hippo Regius in 391 A.D. He was elected Bishop of Hippo in 395 and died there on the 28th of August, 430.

The significance of Saint Augustine's name is similar to that of the other saints who have been discussed, and the ocular implications are identical. This saint, however, while credited with many miracles of a common type as well as some special types, receives no mention in the available sources with reference to the performance of miraculous cures of eyes in ill health; but he has been represented in ecclesiastical art in association with Saint Lucy and, questionably, with Saint Clair (fig. 3). Saint Augustine's life is well documented, and it may be for this reason alone that there exists little in the way of hagiographic legends concerning him, but it seems more acceptable that this lack is sequential to his intellectual stature and to the austerity that permitted little, if any, romantic appeal.

Comment

The almost universal need in times of stress for assistance greater than that commandable by the average person from within himself has eventuated through the ages in the evolution of a common, basic, supernaturalistic zenith, the form of which in the main has retained its familiar essentials from era to era but whose outward embellishments have varied with the dictates of the changing environmental forces whether antiquarian, pagan, or Christian. The interpretation of this known reliance in a higher power, but less than that of the Almighty, necessarily is expressed by each individual in terms of his own ambitions and endeavors; however, it should be the concern of those who administer to his biologic and spiritual requirements, real or apparent, not only to appreciate understandingly the factors productive of bodily ill health but, also, the equally important, more involved personality components that determine individual reactions and attitudes toward dysfunction and afflictions.

Faith in a belief, as one of these components, particularly requires sympathetic evaluation. It is not advocated that this faith be recommended as an agent of healing, whether by implication or by direction, but passively it may be utilized beneficially to promote an increased sense of well-being. If the practitioner is at all familiar with the basis of the beliefs encountered, and these are found so often among the members of our still unassimilated racial population groups, his therapeutic endeavors will undergo no deterioration if he does not deprecate the known but quiet need of the many for the supportive spiritual comfort that derives from a belief in the intercessory powers of the saintly martyrs.

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References

[1] Koch, F. L. P. Patron saints of the eyes. Trans. Amer. Ophth. Soc., 1943, v. 41, pp. 490-535.

OCULAR THERAPY WITH PENICILLIN USED TOPICALLY, INTRAOCULARLY, AND SYSTEMICALLY

WITH CASE REPORTS

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The use of penicillin in the Brooke General Hospital since August, 1943, has shown the wisdom of following certain standard procedures. The following of these general procedures, as originally laid down by the director of penicillin therapy, Lt. Col. Richard B. Grant, Jr. (MC), has had the advantage of allowing the entire staff of the Brooke General Hospital properly to evaluate the results of the drug's use; the value of a director has resided in the fact that a stable drug has been used under standardized procedures. To have worked with a potentially unstable drug such as penicillin, which varies as it does in its potency, would have led to poor results in cases where the need for it was demanding and trying. Supervision overcame this factor.

With a penicillin of known strength, freshly prepared, and potency secured by keeping the solutions in a refrigerator, and checked against culture plates of known bacterial strength, the following procedures were followed and illustrate three modes of administration in ocular conditions; namely, (1) topically, (2) intraocularly, and (3) systemically or intramuscularly. It should be mentioned that penicillin therapy was limited to the most severe conditions. Intravenous therapy, reserved for the most acute of cases, was not resorted to, for in the words of Florey[1] "It is like pouring water down a basin with the plug out."

The following cases from Brooke General Hospital were followed by various members of the ophthalmologic staff:

TOPICAL USE OF PENICILLIN

CASE 1. A private from a cavalry post, aged 23 years, colored, reported that he had been injured on January 16, 1944, when a beer bottle struck him in the face. He was immediately taken to his station hospital, where his injuries were listed as: (1) traumatic rupture of the left eyeball; (2) lacerated wounds of both upper lids, severe, and also of the left lower lid; (3) lacerated wound of the dorsum of the nose, mild; (4) lacerated wound of the sclera of the right eye, severe; (5) lacerated wound of the upper lip. The lacerations were all sutured with silk, except those involving the left eyeball, which was not repaired because of its severity. On January 17, 1944, the patient was transferred by ambulance to the Brooke General Hospital.

Physical examination on admission to Brooke General Hospital: The patient was in no evident pain; both eyes were bandaged, and the multiple lacerations of the face were well approximated. *Ophthalmic examination:* The lids could be opened, but were edematous. Visual acuity in the right eye sufficed only for finger counting at nine feet; the left eye was blind.

Right eye. None of the lid lacerations involved the entire thickness of the lid. Inspection showed that the laceration of the conjunctiva and sclera in the lower nasal quadrant was three-quarters inch long, running like a crescent three-eighths inch from the limbus down toward the cul-de-sac. Both conjunctiva and sclera were sutured together by three silk sutures in such manner that there was pouting and distortion of this segment of the globe anteriorly; discharge of a mucopurulent nature was present at the suture line. The cornea bore a thin, straight laceration, three-eights inch long, run-

ning 3 mm. vertically down from the limbus at the 1-o'clock position. Moderate ciliary congestion was present. The anterior chamber was normal in depth; the pupil, dilated, did not react to light; the iris indicated no pathologic change; no prolapse was evident; a cortical opacity was observed in the upper half of the lens. The fundus could not be seen. Tension was normal by finger palpation. The slitlamp was not used, since this was a bed patient.

Left eye. None of the lid lacerations involved the entire thickness of the lid. The external canthus bore a large laceration, which curved down and out, enlarging the palpebral fissure. The globe was hopelessly ruined by three lacerations and was collapsed.

Progress and Treatment. A stimulating dose of tetanus toxoid, 0.5 c.c., was administered subcutaneously. A smear from the site of the laceration showed no organisms. One minim of 3-percent atropine-sulfate solution was instilled into the right eye twice daily. With the left eye destroyed and the right eye endangered by a corneal laceration, a traumatic cataract, and a severe scleral laceration, all efforts were directed to saving this eye. Accordingly, a fresh solution of penicillin was obtained for local therapy; this solution was made biweekly in the strength of 250 units of penicillin per cubic centimeter dissolved in an isotonic solution of sodium chloride; two drops were instilled into the right eye every 30 minutes, day and night, for 21 days. Between treatments sterile 4 by 4 pads were kept over the right eye at all times, in this manner securing a wet dressing of penicillin solution. The left eye was treated twice daily with 20-percent silver protein mild instillations.

On January 20, 1944, the right eye had vision estimated at finger counting at five feet; the ciliary injection was less in amount. The tactile tension remained normal. Observation of the lens showed that its pathologic change had fortunately not advanced; the scleral laceration still appeared dangerous, with its pouting edges and the overlying mucopurulent exudate.

On the following day, enucleation of the left eye was performed, with implantation of glass ball, under intravenous sodium-pentothal anesthesia. Recovery was uneventful.

On January 22d, it was decided that the silk sutures of the right eye should not be removed, because of the danger of opening the scleral laceration. The site of the laceration showed much less exudate. Penicillin therapy was continued by topical instillation. The blood Wassermann test was reported positive on this date and in consultation a diagnosis of syphilis was made, late and latent, noninfectious.

On January 23d, vision in the right eye remained at finger counting and was improved slightly by lifting the head up and to the left. The pathologic change in the lens had fortunately not proceeded to complete opacification. The laceration of the sclera had healed, but there remained a deformity of this area disturbing the normal contour. The silk sutures had separated and were removed from the lower cul-de-sac. The left socket showed complete healing.

On February 8th, after penicillin therapy had been administered locally for 21 days, no signs nor symptoms of infection of the right eye were present. The soldier was therefore transferred to the Valley Forge General Hospital, an ophthalmic center, for further surgery and the learning of Braille.

Comment. In the writer's opinion, the instillation of penicillin into the right eye prevented further spread of infection through the scleral laceration. It may be argued that no organism was found by

smear; this is true. It may also be argued that the exudate was the normal response to tissue necrosis, produced by the sutures; however, the changes observed in the exudate and its gradual change to a mucopurulent nature in 48 hours and then its gradual decrease made us feel that penicillin was a definite help in preserving this one eye. The systemic use of penicillin in this case would be contraindicated, as previous writers have definitely shown that intramuscular penicillin is not excreted into the tears.[2,3]

CASE 2. An infantry sergeant, 35 years old, white, was admitted to the Brooke General Hospital on October 5, 1943, with the complaint of severe, burning pain in both eyes of one week's duration. He had been treated at the eye clinic as an out-patient for one week with no relief. On hospital admission, the results of the general physical examination were negative.

Ophthalmic examination. Both eyes showed marked congestion of the entire ocular conjunctiva, most evident in the bulbar portion. Strings of pus were present in the cul-de-sacs. Fluorescein instillations showed no ulceration of the cornea. Vision was 20/20, J2—13 bilaterally. A culture and smear were taken; both showed a nonhemolytic Staphylococcus aureus. For the following 10 days, various treatments were tried without improvement. On October 15th, minute ulcers of the corneas had developed; these were superficial and involved the periphery of the corneas. Atropine and hot packs were started. On the following day, the condition had involved more areas of the corneas. The illness had now lasted 17 days. Penicillin topical therapy was started; the solution in the strength of 250 units per cubic centimeter was instilled into each eye every half hour, day and night; between treatments the eyes were kept bandaged.

Further progress. On the 18th of October, definite improvement was observed. The ulcers had not extended in size or number, and there was less discomfort and much less conjunctival secretion. Two days later, there was only faint corneal staining, with but little secretion from the conjunctivas. Subjective improvement also was evident. On October 22d the ulcers were healed, as evidenced by no staining of the corneas with fluorescein; all secretion was now absent. On October 23d, penicillin therapy was discontinued. Vision was 20/20 bilaterally.

Comment. Rapid relief of pain and resolution of inflammation without any harmful effects were produced in this case, in which Staphylococcus aureus was found. This would be expected as the staphylococci are one of a group especially susceptible to penicillin. Other writers[3-6] have reported its efficacy in conjunctival or corneal lesions.

INTRAOCULAR USE OF PENICILLIN

A private from a cavalry unit, aged 31 years, colored, gave the history of having injured his left eye with baling wire while loosening a bale of hay on September 23, 1943, at 4:00 p.m. He presented himself the next day to the eye clinic of his station hospital, and the notes of the chart read that, "the conjunctiva was injected; the cornea was perforated in a curvilinear manner for 4 mm. at the 3-o'clock position near the limbus; iris protruding." An iridectomy under local cocaine anesthesia was performed on that date. The progress notes from September 24th to October 4th revealed that the vision in the left eye was light perception, and in the right eye 20/15. On October 4th, the cornea of the left eye was described as "foggy" with some injection of the conjunctiva. On the following day, the soldier was transferred to Brooke General Hospital. Admission examination revealed the pres-

ence of much ciliary congestion in the left eye; the tension was normal, but the globe was very tender; the pupil was small and deformed as the iris was incarcerated in the wound at the limbus at the 3-o'clock position. The general physical examination was negative. Laboratory reports showed erythrocytes 4,100,000; leucocytes 7,700; hemoglobin 80 percent; polymorphonuclears 50 percent; lymphocytes 50 percent; clotting time 5 minutes; and bleeding time 2 minutes, 30 seconds. The urinalysis showed many white cells; no urethral discharge was present. The Wassermann test was negative as was the Kahn test. On the 8th of October, an iridectomy was performed with a conjunctival flap, under intravenous sodium-pentothal anesthesia.

Progress notes and subsequent therapy. On the third postoperative day the left eye was comfortable; tactile tension normal. Atropine was prescribed, to be instilled twice a day.

October 16, 1943. Tension in left eye was normal; the corneal edema less; the eye generally was progressing nicely. The sutures were removed from the conjunctival flap.

October 20, 1943. Tactile tension was normal, but much ciliary congestion was present. Although the patient did not complain much, it was evident from observation that there was constant discomfort. The cornea was edematous. A dose of 25 million organisms of typhoid vaccine was injected intravenously.

October 25, 1943. The eye remained the same; it was totally blind.

November 4, 1943. More pain was present in the left eye, with much ciliary congestion. There were many cells in the anterior chamber and heavy deposits on Descemet's membrane; the dose of typhoid vaccine intravenously was repeated. Two ophthalmologists agreed that enucleation would eventually be necessary.

November 5, 1943. Examination on this date showed vision, O.D. 20/20, J1 at 13"; O.S., nil for distance and near. Ciliary congestion was great. The cornea of the left eye was clear, but its posterior surface contained very many deposits, which could easily be seen macroscopically, and the deposits formed a rather bizarre picture, simulating a culture growth on the posterior surface of the cornea. There was no hypopyon, however. With the slitlamp, the iris details could not be seen owing to the thick deposit. The fundus, of course, could not be seen, even with the binocular ophthalmoscope. It was recommended that a paracentesis of the anterior chamber be performed with an attempt to irrigate the deposits with penicillin. The operation was performed under sodium-pentothal intravenous anesthesia. The left eye was fixed with fixation forceps. A sharp, 23-gauge needle, one inch long, attached to a tuberculin syringe was inserted into the anterior chamber at the limbus at about the 2-o'clock position in such manner as to lie over the iris and still be away from the anterior lens surface; withdrawal of the barrel was done slowly, until 0.25 c.c. of the aqueous was withdrawn. Collapse of the anterior chamber was quite evident at this point. The syringe was detached carefully from the needle and another syringe, containing 250 units of penicillin per cubic centimeter, was attached to the needle and 0.25 c.c. was injected into the anterior chamber. The latter re-formed, and it was observed that the deposits on the posterior surface were swept off by the inflowing penicillin. The needle was withdrawn and the eye bandaged. A culture of the aqueous was made; also, some was injected into the anterior chamber of a rabbit's eye in the hope of finding a causative organism, but both of these cultures were reported negative after 48 hours.

November 13, 1943. The first postoperative dressing showed that the eye was white! This unexpected result, with

subjective comfort, was pleasing. There was no ciliary congestion. The cornea was clear; the anterior chamber was reformed; the iris details could be seen, and a few individual deposits were present on the anterior surface of the lens. However, with clearing of the anterior chamber, a clear view of the vitreous was possible and an object, moving with the movement of the globe, was seen. This, apparently was a massive detachment of the retina and accounted for the blindness of this eye.

November 15, 1943. A thorough intraocular examination was made on this date, and the diagnosis of massive retinal detachment was verified. Slight ciliary congestion was present.

November 17, 1943. The eye was not so red, and the tension remained above normal.

November 24, 1943. The patient was discharged to limited service with a preserved globe and a quiet eye. The tension was normal, vision nil.

Comment. It is interesting to review the hospital confinement in this case. Immediately after his penetrating eyeball injury, the patient was hospitalized for a period of 10 days at his station hospital; at the general hospital he had spent five weeks up to the time of operation. After the intraocular injection of penicillin, the eye became white in 48 hours, and the soldier was discharged from the hospital 11 days later. It is believed that the injection of diluted penicillin solution into the anterior chamber definitely saved this eyeball, although vision remained nil.

Systemic use of penicillin

An aviation student, white, 25 years of age, was transferred to Brooke General Hospital on March 24, 1944, from a distant station hospital. The pertinent history stated that "while he was on duty in a skeet tower at his airbase, he received an injury to the left eye, caused by a stray pellet from a skeet gun (12-gauge with no. 8 shot), on the 21st of March, 1944, at about 2:30 p.m." A complete physical examination was negative except for the injury to the left eye. The vision in this eye was down to perception of hand movements. There was a round perforation of the left eyeball, 4 mm. below the inferior border of the limbus at the 5-o'clock position. No vitreous was presenting. Atropine was instilled at this time and a dressing applied. On March 22d, ophthalmologic examination was made: "inferiorly toward the 6-o'clock position is a vague, rounded mass, which may be the foreign body, or a localized vitreous hemorrhage, caused by the impact. Pupil is only slightly dilated. There is marked conjunctival edema, laterally. The vision today is finger counting." A radiologic report on this date stated: "there is seen a small metallic, foreign body in the left orbit in the left lower outer quadrant; on the lateral view it was found to be resting well in the orbit, but had not penetrated the cranium or sphenoid sinus."

On admission to Brooke General Hospital, March 24, 1944, the ophthalmologic examination showed the vision to be: O.D. 20/15−, J2 at 13″; O.S. light perception could not count fingers at 10 inches. The finger tension was found to be normal in both eyes. The right eye was normal throughout.

The left eye showed marked ciliary congestion. The site of the perforation was still evident in the area mentioned. Slitlamp examination revealed an increased flare of the aqueous; there were no keratitic precipitates on the posterior surface of the cornea. No opacity was seen in the lens. With the ophthalmoscope, a dull, red reflex was observed, and many large vitreous floaters; the lower half of the vitreous was completely dark and nothing would be seen. Localization of the foreign body by X ray was performed with the Sweet localizer. This

revealed the presence of a spherical foreign body, 2 mm. in diameter, 34 mm. behind the cornea, 9 mm. below the horizontal plane, and 5.5 mm. to the nasal side of the sagittal line.

Laboratory work on admission showed: red blood cells, 4,360,000; hemoglobin, 80 percent, white blood cells, 7,950; polymorphonuclears, 66; lymphocytes, 22; mononuclears, 8; eosinophiles, 4. Urinalysis was completely negative. Sedimentation rate, 0-2-9-18 mm. in one (1) hour; hematocrit, 41; plasma protein, 6.8 gm. per 100 c.c. Kahn, negative; coagulation time, 3′15″; bleeding time 1′45″.

Progress. March 25, 1944. The left eyeball was intensely injected; the vision remained at light perception. The patient this morning stated that for the first time the left eye was paining him. The pupil was well dilated. Blood was seen in the lower part of the anterior chamber, which was very deep. The media were definitely more cloudy today. One cubic centimeter of tetanus toxoid was given as a stimulating dose. An injection of 25 million organisms of typhoid vaccine was given intravenously for its foreign-protein effect. It was evident then, from the reports given, that there was a double perforation of the eyeball, caused by the pellet in its entrance and exit at 34 mm. from the cornea.

March 27, 1944. Subjectively, the patient was complaining of more pain in the eye. There was no edema of the lids, but there appeared to be more lacrimation. Vision was reduced to light perception. No fundus reflex was obtainable. The possibility of detached retina was being borne in mind; also the fact that traumatic injury was created at the point of exit of the pellet and possibly also behind the globe. Foreign protein was again administered in the form of 25 million organisms of typhoid vaccine intravenously.

March 29, 1944. The patient was requesting frequently, doses of medicine for pain in the eye. Edema of the upper lid was present.

March 30, 1944. Penicillin solution was injected on this date into the anterior chamber of the left eye, with the patient under intravenous sodium-pentothal anesthesia. The white count was increased at this time to 10,050 with 66 percent polymorphonuclears. The same penicillin-injection technique was used as in case 2 In this case, however, 0.5 c.c. of aqueous was withdrawn, for, as mentioned previously, the anterior chamber was very deep, and 0.5 c.c. penicillin solution was injected.

March 31, 1944. Edema of the lids was less than on the previous day; subjectively, the patient has not complained of so much pain as previously.

April 1, 1944. Examination of the eye showed that there was slight edema of the left upper lid, also the same amount of congestion as previously (increased possibly by fixation forceps and needle trauma). The cornea was clear, the anterior chamber was very deep, with no hypopyon or blood; the pupil was dilated. In order to give this eye every possible chance, penicillin was ordered to be given intramuscularly to combat the endophthalmitis and possible retrobulbar infection. An intravenous injection of 40 million organisms of typhoid vaccine was also to be administered, for the previous administrations did not raise the mouth temperature beyond 100.8°. A smear from the aqueous was reported: "No bacteria are found, and a 48-hour culture of the aqueous shows no growth."

Therapy consisted of instilling one drop of 3-percent atropine-sulfate solution into the left eye once daily and hot compresses to the eye three times daily. The intramuscular or systemic use of penicillin was started on April 1st by injecting 25,000 units every three hours day and night, and this was continued for 42 days.

By the 4th of April, the patient was

more comfortable and he stated that he could see light and shadows temporally. The ophthalmoscope still revealed no retinal reflex. The edema of the lid had disappeared completely. The white blood count on this date was 8,300; hemoglobin, 80 percent; the differential count was 68 percent polymorphonuclears, 31 lymphocytes, and 1 monocyte. The plasma protein was 6.6 percent.

On May 12th the penicillin therapy was discontinued and the condition of the eye was as follows: Vision remained at light perception; a faint ciliary flush persisted; the cornea was clear; there were a deep anterior chamber, a slight fundal reflex superiorly and nasally, and a grayish mass, slightly movable, could be seen above, which undoubtedly was a detached retina.

When intramuscular injections must be repeated frequently, it is important to keep the volume as low as possible in order to avoid local discomfort at the site of injection—the usual practice has been to employ a concentration of 5,000 units per cubic centimeter of isotonic solution of sodium chloride.

It is also well to remember to give large initial doses of penicillin, because bacteria may become "penicillin fast" with small doses. The amount to be given will vary with the individual case, as many as 6 million units having been given a month in some cases; it will vary with the type of severity of infection. It is suggested that the adequate dosage, although not clearly defined, be kept around 200,000 units daily. The intramuscular route is the usual route[5] by which this drug is administered. It should be given into the muscle and not into the subcutaneous tissue; its use in ocular conditions is similar to that adopted in other systemic infections.

Comment. This eyeball was definitely saved by the systemic use of penicillin. Edema of the upper lid is in itself always a serious sign whether it denotes an endophthalmitis or an orbital cellulitis. The intramuscular use in this case was prolonged, perhaps, but considering the seriousness of the condition, was justified. We have had no untoward reaction from the use of penicillin in our eye cases; urticaria, transient azotemia and eosinophilia were watched for.

Summary

1. Penicillin is a wonderful new therapeutic agent which can safely be added to the armamentarium of ophthalmologists.

2. Penicillin can be utilized in the three ways demonstrated in the foregoing case reports.

3. The use of penicillin by injection into the anterior chamber offers promise of beneficial results, and this mode of therapy warrants further investigation.

The writer is indebted to Lt. Col. Richard B. Grant, Jr. (MC), A.U.S., Director of Penicillin Therapy, for his ready advice in the treatment of these cases.

References

[1] Florey, H. W. Time, 1944, May 15, p. 62.
[2] Rammelkemp, C. H., and Keefer, C. S. The absorption, excretion, and distribution of penicillin. Jour. Clin. Invest., 1943, v. 22, May, p. 425.
[3] Keefer, C. S., *et al.* Penicillin in the treatment of infections. Jour. Amer. Med. Assoc., 1943, v. 122, August 28, p. 18.
[4] Wong, W. W. Penicillin and gramicide as ocular chemotherapeutic agents. Arch. of Ophth., 1944, v. 31, pp. 166-167.
[5] Penicillin: War Department Technical Bullletin No. 9, February 12, 1944.
[6] Lyons, C. Penicillin therapy of surgical infections in the U. S. Army. Jour. Amer. Med. Assoc., 1943, v. 123, Dec. 18, p. 16.

SEROLOGIC STUDIES IN ACUTE EYE DISEASES*

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It has been stated that the sera of patients affected by an acute febrile illness as, for example, pneumonia, tonsillitis, sinusitis, and acute upper respiratory infections, will produce a swelling of the capsule of Type XXVII pneumococcus.[1]

It was decided to apply this simple test to the sera of patients who had various eye lesions with or without febrile reactions. If it were possible to demonstrate the nonspecific capsule (N.S.C.S.) swelling, one might postulate that the etiology of the ocular pathology was due to a hidden focus of infection.

It is well known that the pneumococcus contains three different chemical constituents; namely, (1) type-specific polysaccharide A, (2) the nontype-specific nucleo-protein B, and (3) the somatic C fraction. The last named of these, according to Tillett, Goebel, and Avery[2] is different chemically and immunologically from the first two, and is sometimes known as a nonspecific carbohydrate.

By using this nonspecific carbohydrate in concentrated form, R. Ash[3] concluded that precipitants for the pneumococcus were present not only in pneumococcic infections, but also in illnesses due to the gram-negative as well as to the gram-positive organisms. Syphilitic infections did not produce this phenomenon, nor did it generally appear in tuberculous disease, or, if it did, only in small amounts.

Normally, the sera of healthy humans do not produce capsular swelling, judging from the work of G. Lofstrom[1] in 1939, who stated that the sera of 120 healthy recruits in the Swedish army did not produce the reaction with the pneumococcus; but he found that it was positive in one third of 157 soldiers who had an upper-respiratory infection, and that this percentage was independent of the elevation of the body temperature. The reaction became negative between the sixth and the twelfth day in 12 cases running a smooth course. But the cases either ended fatally or developed complications in others wherein the reaction remained positive.

In an attempt to correlate the foregoing observations with the responses to be found in acute inflammatory eye conditions, 5 to 10 c.c. of blood were collected from each of the 16 patients tabulated. Sera were separated and stored in the refrigerator until all were on hand. The routine Neufeld type of pneumococcus typing reaction was done with all sera. The pneumococcus Type XXVII used was obtained from the American Type Culture Collection and when received had a very small capsule. However no animal passage nor other method of enhancing capsule size was attempted, as it was felt that sufficient material was present for observation of swelling. Observations of mixtures to determine swelling were made (1) at once, (2) after four hours at room temperature, and (3) after overnight storage in the refrigerator.

Case 13 not only exhibited swelling of the capsule, but also microscopic agglutination. The Type II pneumococcus that was recovered from the tonsillar material probably represents only the predominant type, and Type XXVII may have been present, but missed.

In using this test on 16 cases exhibiting acute inflammatory eye lesions, it was found positive in one of seven patients with iritis, positive in one of four cases

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TABLE 1

DATA FROM 16 CASES OF OCULAR DISEASE IN WHICH THE LOFSTROM TEST WAS USED

No.	Pt.	Diagnosis	Day of Disease When Tested	Age	Sex	Race	Amt. of Typhoid I.V.	Organism Found	Non-spec. Cap. Swell.	Remarks
1	M.F.	Iritis, O.D.	10 days	34	F	W	0	none	−	Cause undetermined
2	M.S.	Iridocyclitis, O.S. choroiditis	30 days	30	F	W	85 M	none	−	Possibly due to chronic tonsillitis
3	E.B.	Uveitis, O.U.	18 days	3	M	W	0	none	−	Granulomatous—probably tbc. Sequelae exanthem—blind in O.U.
4	R.R.	Dendritic ulcer	21 days	56	M	W	0	none	−	Cured with one thermophore treatment
5	B.C.	Uveitis, O.U.	9 mos.	32	F	C	0	none	−	Positive tuberculin (.0025 mg.) skin test. 1 tooth abscessed. Chronic tonsillitis—probably tbc.
6	R.W.	Iritis, plastic, O.D.	9 days	28	M	W	0	none	+	Gonorrheal iritis
7	J.H.	Corneal abscess	14 days	43	M	W	0	none	−	Foreign body removed, abscess followed
8	V.A.	Recurrent iritis, O.S.	7 days	25	F	W	0	none	−	Chest X ray for tbc. positive. Positive 2d strength P.P.D. (½ dose) (.0025 mg.)
9	K.G.	Iritis, O.D.	3½ mos.	61	F	W	0	none	−	Ariboflavinosis; edentulous. Inactive pulm. tbc.; etiology probably tbc.
10	M.A.	Chorioretinitis juxta papillaris	7 days	24	F	W	0	none	−	Cause undetermined
11	H.F.	Hypopyon ulcer	8 days	57	M	W	before & after 50 M	none	−	From thorn. Treatment with thermophore and sulfadizine
12	T.R.	Corneal abscess	8 days	16	F	W	1000 M	none	−	From broken glasses. Treatment with penicillin locally, X ray, and sulfadiazine
13	G.S.	Choroiditis	35 days	21	F	W	400 M 3 wks. ago	pneumo. strep. staph.	+	See case discussion
14	E.P.	Central choroiditis, O.U.	7 days	33	F	W	0	none	−	5 mos. pregnant
15	W.S.	Choroiditis, O.S.	42 days	39	M	W	0	none	−	Cause undetermined
16	L.H.	Optic neuritis, O.U.	22 days	43	F	W	0	none	−	Probably due to hair dye

with chorioretinitis. This test was negative in two cases of corneal abscess, one case of dendritic ulcer of the cornea, and one case of optic neuritis. Out of this group, the nonspecific capsular swelling was not present in three cases in which the patient had received artificial fever from the use of intravenous paratyphoid-typhoid vaccine. The two cases which showed a positive reaction were as follows:

Case 6. R. W., a white man, aged 28 years, entered the hospital on the ninth day of his illness with an acute uniocular plastic iridocyclitis. He gave a history of an acute Neisserian urethritis eight years ago, followed in a few months by an acute arthritis of the right knee. During his hospitalization the complement fixation for gonorrhea was positive, but the prostate was negative for pus. X-ray studies of teeth and chest were negative. Kahn, urine, and brucella agglutination tests were negative. Diagnosis in this case was gonococcal iritis. The patient's serum gave a positive reaction to Type XXVII pneumococcus. Treatment was successful with sulfathiazole and the Kettering hypertherm. It has not been possible to obtain a follow-up reaction of his blood.

Case 13. G. S., a white woman, aged 21 years, had an extensive chorioretinitis

and optic neuritis with an eccentric vision of 6/60. She was given a four-day course of sulfadiazine. An adequate blood level was obtained, but this was stopped because of nausea and vomiting. A total of 400 million paratyphoid-typhoid vaccine was given intravenously on four separate days, but the choroiditis continued to advance. She showed a moderate amount of keratitic precipitates and a few cells in the anterior chamber. X-ray studies of her teeth and chest were negative. Cervical examination by a gynecologist was negative. Agglutination for brucellosis, Kahn, typhoid, tularemia, and urine tests were entirely negative. The otolaryngologist thought her sinuses were normal and that her tonsils were not involved enough to warrant removal unless no other cause could be found. On the thirty-fifth day of her illness, just the day prior to the tonsillectomy, the serum produced a capsular swelling of Type XXVII pneumococcus with microscopic agglutination. One week postoperatively the eye lesions (uniocular) were the same, but the N.S.C.S. test was negative. Two weeks postoperatively the serum still remained negative and the eye lesions had improved in that there were no more hemorrhages, less retinal edema, no cells in the anterior chamber, and only a few mutton-fat K.P. remained. It was interesting to note that her tonsils cultured Type II pneumococcus, streptococcus, and staphylococcus. Her vision to date remains 6/60 eccentrically.

Four patients in this group, thought to have tuberculous uveitis, showed no nonspecific capsular swelling. This tends to confirm the work of Ash[3] in tuberculous disease, who used the concentrated C fraction.

It is realized that only a few cases are reported here and for this reaction to be of further significance a greater number of cases should be studied. It is not an expression of wishful thinking to state that if a serum produces a positive reaction, the etiology for the eye lesion is likely to be found in a focus harboring the causative organism.

Just as Lofstrom[4] claims that one may use his test (nonspecific capsular swelling of pneumococcus) in differentiating a bacterial meningitis from a virus meningitis, in that it is positive in the former and negative in the latter, an ophthalmologist might differentiate an iridocyclitis or choroiditis due to a bacterial agency or any other etiologic agent as an allergin or a virus.

Summary

1. The sera of 16 eye patients were used in the manner of the Neufeld test to determine the presence of an agency that would produce a nonspecific capsular swelling of Type XXVII pneumococcus.

2. Two cases showed a positive reaction.

3. The etiology of these two cases was determined to be an organism in the gram-negative or the gram-positive groups.

4. After removal of the cause of the choroiditis, the test became negative.

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References

[1] Lofstrom, G. Seraloiska Studier vid Akuta Pnaumonier. Nordisk Med., 1939, v. 2 (Hygeia 100).

[2] Tillett, Goebel, and Avery. Jour. Exper. Med., 1930, v. 52, p. 895.

[3] Ash, R. Non-specific precipitins for pneumococcic fraction C in acute infections. Jour. Infec. Dis., 1933, v. 53, p. 89.

[4] G. Lofstrom, A monograph recently published in Sweden. Editorial, New England Jour. Med., 1944, v. 230, Jan. 20, no. 3, p. 91.

NOTES, CASES, INSTRUMENTS

INTRAOCULAR INJECTION OF PENICILLIN IN OCULAR INFECTIONS

PRELIMINARY REPORT

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The purpose of the present paper is to report the comparative results obtained in the treatment of two cases of corneal ulcers with hypopyon, one having been treated with intraocular and subconjunctival injections of sodium penicillin, the other solely by subconjunctival injections of sodium penicillin.

The information I was able to gather before I started the penicillin therapy was meager, especially in regard to the concentration of this drug and to the best route of administration, investigations and reports on this subject being at the time almost nil. The two common methods of administration of penicillin, intravenous and intramuscular, were discarded from the beginning, for it was thought that a direct application would be more effective and beneficial than the intravenous and intramuscular injections, which generally are given at very frequent intervals.

In case 1 an injection into the anterior chamber of 50 Oxford units of sodium penicillin was followed by subconjunctival injections, whereas in case 2 only subconjunctival injections were used. Both cases were complicated by other pathologic changes; namely cataract in the first and absolute glaucoma in the second.

REPORT OF CASES

Case 1. M. F., a man, aged 70 years, was first seen in my office on April 17, 1944, because of an ulcer of the cornea of the right eye. Vision, O.D., was perception of hand movements; O.S., 20/70. For about eight days he had been treated by a private physician who had cauterized the ulcer and had advised atropine instillations, sufathiozole ointment, and hot compresses, but with no apparent results.

Examination showed an infiltration of the cornea of the right eye from the central and nasal sector to the lower part, extending about 4 mm., a severe conjunctivitis, and perikeratitic injection. The rest of the cornea was hazy. The slitlamp examination showed an enormous number of cells in the aqueous and a small half-moon of exudates in the lower part of the anterior chamber. The pupil was irregularly dilated with some posterior synechiae, and there was a cataractous lens. The tension was normal to touch, and the eye very painful, particularly in the ciliary region. The patient complained of severe frontal headaches.

Sulfatherapy was started internally and continued for about three weeks. Besides the local treatments with atropine, local applications of sulfathiazole ointment 5 percent, applications of antiflogistine, ultraviolet irradiations, cauterization, and other measures were used. The only possible foci of infection were eliminated by the removal of several teeth which showed apical abscesses. The smear examination was negative.

On April 22d the condition of the eye was worse; namely, pus in the anterior chamber was filling about one fourth the cavity, the infiltration of the cornea had become very deep, and the general signs and symptoms were gradually becoming more severe.

Typhoid therapy was started, with an initial dose of 15 million triplo-typhoid bacilli intravenously, which caused a fe-

ver of 104°F. At different intervals the typhoid therapy was repeated, with increasing doses, while the local treatment was continued and the sulfatherapy repeated. On May 9th the patient was admitted to the New York Eye and Ear Infirmary. Inasmuch as a fibrinous and cellular exudate was filling almost one half of the anterior chamber, a paracentesis was done with a keratome incision of the upper part of the limbus, and aqueous was aspirated with a syringe and sent to the laboratory for smear and culture; this was later found to be negative. Several attempts were made to cleanse the anterior chamber of the fibrinous exudate by lavage (repeated irrigations with a saline solution), but very little material was washed out, the mass being strongly adherent to the iris mesh. More irrigations were made with a fresh solution of 5-percent sodium sulfathiazole, and an atropine and sulfa dressing was applied. For the next two days the amount of pus was apparently reduced, but soon the condition returned to the former stage so that as a last resort, I decided to start some sort of penicillin therapy.

On May 15th the patient was returned to the operating room where without either paracentesis or the withdrawing of aqueous, 0.05 c.c. of sodium penicillin, containing 50 Oxford units, was forced into the anterior chamber with a tuberculin syringe. Another 100 units were injected subconjunctivally. Examination of the eye on the following day showed the complete disappearance of the hypopyon; there was a mild chemosis of the bulbar conjunctiva. The patient stated that for the first time since his illness he had been able to rest at night. The subconjunctival injections were repeated daily at the bedside following instillations of a 4-percent cocaine solution for 10 minutes, the patient's only complaint being a sharp pain upon introduction of the penicillin which lasted only a few minutes.

Figs. 1 and 2 (La Rocca). Corneal ulcer, right eye. Fig. 1, case 1, infiltration of the cornea with hypopyon. Fig. 2, case 1, after treatment with penicillin.

The number of units injected was gradually increased to 1,000, and on May 26th the cornea for the first time did not stain with fluorescein. The patient had been discharged from the hospital on May 20th and the remaining injections were given in my office. As figure 2 shows, a corneal leukoma and a diffuse haziness of the cornea were still present as a result of the long-standing infection.

Case 2. F. D., a man aged 58 years, was first seen in my office for the present

illness on April 27, 1944. The right eye was affected with absolute glaucoma: T = 3 plus. Vision was O.D. no light perception; O.S. 20/200; with correction 20/30. There was an ulcer of the cornea in the glaucomatous eye, with an infiltration of the central area and a diffuse disepithelization of the cornea; numerous K.P. and a hypopyon were in the lower part of the anterior chamber. The report of the smear of the conjunctiva was "Occasional polymorphonuclear leukocytes, no eosinophiles nor inclusion bodies, nor bacteria. The culture revealed diphtheroid bacilli; the Wassermann test was negative, and there were no apparent foci of infection. The treatment followed was similar to that in case 1; namely, sulfa drugs, typhoid therapy, local treatments, ultraviolet irradiations—with the same negative results.

On May 15th when I was able to obtain 100,000 units of penicillin for case 1, some of the same solution was injected in the lower part of this patient's bulbar conjunctiva, at daily intervals.

He complained of sharp pains soon after the injection, lasting one or two minutes. The doses gradually reached the 1,000 units on May 24th and were continued daily in that amount to June 4th. The hypopyon disappeared very slowly from about May 22d, seven days after the first injection of penicillin, and the corneal ulcer for the first time did not stain on June 6th, 22 days after the beginning of the penicillin therapy.

Summary and Comment

Two cases of ulcer of the cornea with hypopyon are reported in which the elimination of focal infections, local treatments, sulfatherapy, fever therapy, and ultraviolet irradiations failed to produce results after almost one month of treatments. Penicillin therapy was begun, with striking success in one case in which the penicillin was introduced directly into the anterior chamber and the treatment continued with subconjunctival injections; with more modest results in the other case, in which the penicillin was administered by subconjunctival injections alone.

In case 1 the hypopyon disappeared completely in less than 24 hours, and the ulcer healed after 11 days of further therapy. In the second case the hypopyon disappeared after 7 days and the ulcer healed after 22 days.

Although two cases are not enough from which one may draw conclusions of great importance, the results obtained point to the following facts:

1. The direct application of penicillin to the spot of infection is of greater therapeutic value than injections relatively near to it, such as subconjunctival injection.

2. The amount of penicillin required for the almost instantaneous disappearance of the hypopyon by intraocular injections is very small compared with the amount necessary by subconjunctival injections.

3. The use of penicillin by intraocular injection is not injurious to the eye, and the local reaction is negligible, whereas the pain and the conjunctival chemosis resulting from subconjunctival injections, although not serious, are somewhat annoying.

4. The handling of penicillin is not difficult. I made a mother solution of 10,000 Oxford units per c.c. which was kept at a temperature of 5°C. (which is supposed to be active for one month). From the mother solution, fresh solutions containing the amount needed were made for immediate injections.

The recommendation for the use of penicillin by intraocular injections is to be considered as an attempt to reach a better knowledge of the action of this

drug in ocular infections. It is fully realized that revisions of the dosage may be required as experience accumulates on this subject.

42 Fifth Avenue.

CONGENITAL CATARACT FOLLOWING RUBELLA IN THE MOTHER

Report of a case

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American ophthalmologists are indebted to Dr. Algernon B. Reese[1] for calling to their attention the occurrence of congenital cataract and other congenital anomalies in children born of a mother who had rubella during the first three months of pregnancy. This subject appeared in the Australian ophthalmologic literature in 1942 and 1943, from the pens of N. M. Gregg[2] and a group of colleagues.[3] Dr. Reese reviewed these two papers and added three cases of his own.

The findings in the cases reported included: (1) congenital cataract in 94 patients, of which 20 had the condition unilaterally; (2) microphthalmia; (3) intolerance to atropine; (4) congenital cardiac condition, diagnosed as patent ductus arteriosis in most instances; (5) mental retardation; (6) microcephaly; (7) deaf-mutism; and (8) difficulty in feeding.

Since Dr. Reese presented this matter before the staff of the Institute of Ophthalmology of Presbyterian Hospital, New York City, I have studied one case and encountered two others which are under the care of colleagues.

Case report. D. G., a girl, aged 4½ months, was referred to me on April 18, 1944, because of a white pupil of the right eye, which had been noticed for several weeks. The child had been under the care of Dr. Marguerite A. Schafer, of Hawthorne, New Jersey. The baby was born at term, but has been an extremely difficult feeding problem. At the age of eight weeks, she weighed no more than her birth weight (6¼ lbs.). She suffered from rickets and scurvy, and had a spontaneous hemorrhage into her left knee joint, with subsequent abscess formation. Her parents and her five-year-old sister had "German measles" when her mother was in her second month of pregnancy.

Physical examination revealed no abnormalities except a dense central cataract of the right eye, a congenital cardiac condition (probably patent ductus arteriosis), and malnutrition. The eyes were normal in size, with anterior chambers of the usual depth, and normal intraocular pressure.

The cataract of the right eye was needled on April 21, 1944, at the Institute of Ophthalmology. Absorption of the lens has been slow. Up to date, there has been no evidence of sensitivity to a daily instillation of 0.25-percent atropine sulfate in the right eye.

70 East Sixty-sixth Street.

References

[1] Reese, A. B. Congenital cataract and other anomalies following German measles in the mother. Amer. Jour. Ophth., 1944, v. 27, May, pp. 483-487.

[2] Gregg, N. M. Congenital cataract following German measles in mother. Trans. Ophth. Soc. Australia, 1942, v. 3, pp. 35-46.

[3] Swan, C., Tostevin, A. L., Moore, B., Mayo, H., and Black, G. H. B. Congenital defects in infants following infectious diseases during pregnancy. Med. Jour. Australia, 1943, v. 2, pp. 201-220.

CHEMOTHERAPY IN TREATMENT OF SYMPATHETIC OPHTHALMIA

Case report

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It is not the purpose of this paper to speculate upon the etiology of sympathetic ophthalmia. In consideration of treatment of a disease so damaging to vision, however, it is well to recall that at least two, and possibly other factors are thought to be involved in its causation. It is generally conceded that allergy to uveal pigment constitutes one phase as demonstrated in the work of Elschnig,[1] Woods,[2] and by numerous subsequent observers. In addition there also seems to be an infective phase, possibly from an unknown virus or its toxin, or even possibly tuberculous, in that all the manifestations of this disease cannot be explained from an allergic standpoint alone.

Treatment of this syndrone has therefore been empiric in nature, with the exception of the use of uveal pigment injected hypodermically.[3] The normal reaction of the body apparently consists of the development of immunity to the pigment, thus preventing further absorption from the injured area. The rationale of injection of pigment therapeutically is to raise the pigment-antibody content of the blood serum sufficiently to obtain immunologic balance. Susceptibility to sympathetic ophthalmia follows any failure to develop such immunity.

Foreign protein, chiefly typhoid vaccine,[4] tuberculin,[3] diphtheria antitoxin,[5] and boiled milk,[6] have been extensively used, and are most helpful in the management of the disease, although in no instance has it been claimed that eradication of the pathologic process has been attained. Chemical treatment has for the most part been confined to the use of massive doses of salicylates[7] or arsenicals, chiefly neosalvarsan.[7] Symptomatic improvement has followed in many instances in which these drugs have been employed. Local treatment consists chiefly of the maintenance of full pupillary dilatation in order to prevent formation of synechiae. The attainment of this objective is frequently rendered difficult by the complication of increased tension, for relief of which repeated paracenteses may be done.

Although use of sulfonamides in this disease has generally been held to be futile, Gamble,[8] in 1940, reported a case in which chemotherapy was employed during exacerbations, with very marked improvement. This author felt that the disease could occasionally be controlled enough to maintain useful vision without expectation of actual cure. However, at the death of his patient (from accidental causes), serial sections not only proved the disease to be sympathetic ophthalmia, but also indicated that considerable active pathologic change was present in an eye which appeared quiet clinically.

Thygeson,[9] on the other hand, definitely stated that no improvement was noted in two cases of sympathetic ophthalmia treated by him with sulfathiazole and sulfadiazine.

Case report

A case of sympathetic ophthalmia is reported in which fair vision has been retained over the period observed, by the use of sulfonamides during periodic exacerbations, in conjunction with intravenous typhoid therapy and massive doses of salicylates.

C. P. was struck in the left eye, on February 7, 1941, presumably by a piece of rock. Site of wound was in the limbic area at about the 5-o'clock position and

* From the General Hospital of Weston, A. F. Lawson, Chief of Staff.

apparently penetrating. As the patient had very little pain at the time, no physician was consulted. Spontaneous healing of the wound apparently occurred, and except for moderate injection of the injured eye, the patient was symptom free for about two months. Following this, considerable pain developed in the eye and he noticed rapid loss of vision. As he lived in an isolated community, he did not consult a physician until April 22, 1941, when vision in the injured eye had failed completely and considerable blurring of vision had been noted in the right eye. He was referred to us chiefly for relief of the intense pain in the injured eye.

When first seen, the injured eye was entirely blind; intraocular tension was 76 mm. Hg (Schiötz). A small ciliary staphyloma of purplish hue and about 3 mm. in diameter was protruding at the limbus at the 5-o'clock position. The pupil was markedly constricted and irregular from annular posterior synechiae, and entirely occluded with dense white exudate, precluding ophthalmoscopic examination. The right eye was moderately injected and the pupil constricted, but no synechiae were present. There were numerous keratitic precipitates on Descemet's membrane, and many cells were floating in the anterior chamber, giving a typical aqueous flare. There was moderate ciliary tenderness. Intraocular pressure was 29 mm. Hg (Schiötz). On ophthalmoscopic examination a red reflex could be obtained, but no details of the fundus could be made out. Vision was reduced to light perception.

As the injured eye was exceedingly painful, and as there was no hope of restoration of vision, it was immediately enucleated. Treatment of the sympathizing eye was instituted by the use of intravenous typhoid therapy and massive doses of salicylates. The appearance of the eye as well as vision improved slightly under this routine, only to return promptly to the original state. It was then decided to try sulfonamides (sulfathiazole orally), a concentration of approximately 5.5 mg. percent being maintained in the blood. Administration of the drug was continued for one week, with dramatic results, including clearing of most of the precipitates from Descemet's membrane and disappearance of the aqueous flare. Vision was 20/30 unaided. There have been nine acute exacerbations of the disease, lasting from one to three weeks during the subsequent two years the patient has been observed. Each attack has been controlled by the use of sulfathiazole, although the response has been more rapid on certain occasions than at others. There has been no elevation of tension and vision has been maintained at approximately 20/30. A few keratitic precipitates remain after each exacerbation and are the only evidence of the presence of the disease. Further hospitalization has been unnecessary.

Summary

A case of sympathetic ophthalmia is reported in which chemotherapy was employed in conjunction with other therapeutic methods, after the apparent failure of the latter. Dramatic resolution of the inflammatory process was observed at each exacerbation, following use of the drug, although it was impossible to prevent its recurrence. Vision of 20/30 and an eye which is clinically fairly quiet has been maintained over a period of about two years. Although it is generally thought that chemotherapy is of no avail in any type of uveitis, it is possible that an occasional case of sympathetic ophthalmia may be controlled although not cured through its use.

169 Main Avenue.

References

[1] Elschnig. Arch. of Ophth., 1910, v. 75, p. 549; 1911, v. 79, p. 428.
[2] Woods, A. Arch. of Ophth., 1916, v. 45, p. 557; 1917, v. 46, pp. 8, 283, 503. Jour. Amer. Med. Assoc., 1921, v. 77, p. 1317. Amer. Jour. Ophth., 1936, v. 19, pp. 9, 100.
[3] Gill, L. D. South Med. Jour., 1941, v. 34, pp. 959-968.
[4] Shannon. Arch. of Ophth., 1937, v. 17, p. 186.
[5] Verhoeff. Arch. of Ophth., 1924, v. 53, p. 517; 1927, v. 56, p. 28.
[6] Heine. Klin. M. f. Augenh., 1923, v. 71, p. 70.
[7] Gifford, H. Jour. Amer. Med. Assoc., 1900, p. 341. Ophth. Rec., 1908, v. 17, pp. 129, 584; 1914, v. 23, pp. 64, 349.
[8] Gamble, R. C. Amer. Jour. Ophth., 1941, v. 24, pp. 49-51.
[9] Thygeson, P. Arch. of Ophth., 1943, v. 29, p. 1020.

TRICHO-EPITHELIOMA OF EYELID

Case report*

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Tricho-epitheliomata are somewhat rare nonulcerating, nonmetastasizing, often multiple, benign tumors of the skin, of limited growth. Histologically distinctive, clinically they are not distinguishable from many other benign tumors of the skin and dermal derivatives. They present an appearance, in common with tumors of the sweat and sebaceous glands, of small, slightly elevated, flat, pale or translucent, circular or slightly irregular hard tumors, frequently on or near the face.

Very few cases of this uncommon condition have been reported, possibly because the tumor, when uncomplicated, is not of major clinical importance. The authors recently encountered an example of tricho-epithelioma of unusual interest because of its location (on the palpebral margin of an eyelid) and its clinical appearance. A brief summary of this case is presented.

* From the Department of Surgery, E.E.N.T. Section, and the Laboratory Service, Bushnell General Hospital.

Case report

A white corporal, aged 21 years, reported to the eye clinic at Bushnell General Hospital on February 17, 1943. He complained of a small recurrent, painless, localized nodule bordering on the margin of the left upper eyelid. A tuft of material resembling blond hairs protruded from the swelling. The original nodule was first noticed about January, 1942, when a clump of blond hairs was observed among the cilia of the left upper eyelid. These unusual cilia increased in number and length. A small localized elevation of the skin of the eyelid developed concurrent with the abnormal cilia. The patient cut the strand of blond hair when it became noticeably longer than his normal cilia. The growth was never epilated.

Prompt recurrence of the growth occurred after its removal by curretting on or about September 15, 1942. Ulceration was never present. At no time was the growth of the hairy nodule rapid. Development, except for growth of the blond hair, was apparently stationary for two months before the patient reported to this clinic. There was no known etiologic factor. Neither this soldier, nor any member of his family, had a history of nodules on the face, forehead, eyelids, or nose. Complement fixation tests for syph-

ilis were negative. Complete physical examination revealed no other abnormality than the nodule in the left upper eyelid.

Examination of patient's left upper eyelid revealed a tuft of material resembling finely teased dental floss protruding from the lid margin. This material originated in a small localized firm subcuticular swelling. Viewed through a magnifying loupe, the strand of light-colored material was identified as immature hairs of varying lengths and sizes. The longest hair measured about 10 mm. The terminal one third of the strand of hair curved downward.

Fig. 1 (Keyes and Queen). A drawing of the tumor.

The tumor and attached cilia were extirpated by operation on March 17, 1943. The skin of the eyelid was split over the upper limit of the tumor. The skin was undermined and easily freed from the underlying nodule. The tumor was removed without trauma or rupture. Recovery was uneventful. Nine months after operation there was no evidence of recurrence.

PATHOLOGIC REPORT

Gross: The specimen consisted of a small round firm elongated piece of tissue (0.4 by 0.3 by 0.3 mm.) from which a clump of very light brown hair protruded.

Microscopic: There was no evidence of a capsule nor of epithelial covering. The general appearance of the specimen was that of modified corium. The stroma varied in density in different parts of the specimen. One area consisted of firm fibrous tissue with a hyalin keloid appearance and very few cellular elements. Other areas contained many structures supported by a less dense, more normal-appearing connective-tissue stroma.

Each low-power field contained many immature hair follicles, some of which contained a partly developed hair stalk. The internal sheath of the hair contained keratin mingled with the cells of Henle's and Henkle's layers. Occasionally a glass membrane was present. Many irregularly shaped masses of basal cells were noted. There was an effort at palisading of the basal layer of cells. Some of these cell masses were solid, suggestive of the appearance of Krompecher's carcinoma.

Fig. 2 (Keyes and Queen). Histologic detail of a portion of the tumor nodule. Acc. No. 91883 U. S. Army Medical Museum.

No prickle cells nor other cytologic evidence of malignancy was observed. Other cell masses contained cystic spaces in which keratinous material was concentrically arranged. Hair shafts were definitely present in some of these cystic spaces. The appearance of the hair follicles suggested a hamartomatous reaction, possibly based on lanugo or infantile hair follicles. Sebaceous glands and ducts of sweat glands were also present in the specimen. The blood supply was scant.

Col. J. E. Ash (MC), U.S.A., curator of the Army Medical Museum, reported on this specimen as follows: "I do not believe it is malignant, more of a nevoid lesion, some of the hair follicles being immature, of the lanugo type. I am not too fond of the term tricho-epithelioma, but it would seem to fit this tumor."

Diagnosis: Tricho-epithelioma, benign, of eyelid.

Comment

The term tricho-epithelioma is used in a histologic sense. The trichomatous nature of this solitary lesion was obvious clinically and histologically. The presence of immature hair differentiated the growth clinically from the tumors of Brooke,[1] Jarisch,[2] and Fordyce.[3] Reference is made to the articles of McDonagh[4] and Traenkle[5] for a discussion of the relationship of epithelioma adenoides cysticum, tricho-epithelioma, and basal-cell cancer.

A search of the available medical literature failed to reveal a report of a similar lesion on the margin of the eye lid.

Definite, clear-cut descriptions of tricho-epitheliomata are difficult to find. Many of the standard texts dealing with tumors do not mention the condition, as Boyd (Surgical pathology, ed. 5), Pack and Livingston (Treatment of cancer and allied diseases). Ewing (Neoplastic diseases, ed. 4), in his discussion of epidermal carcinoma, does not refer to tricho-epithelioma as such, though he does mention (p. 904) that "some basal cell tumors with compact groups of small elongated cells, or occasionally with adenoid characters, arise from the hair follicles."

References

[1] Brooke, H. G. Epithelioma adenoides cysticum. Brit. Jour. Derm., 1892, v. 4, Sept., p. 269.
[2] Jarisch. Zur Lehre von den Hautgeschwülsten. Arch. f. Derm. u. Syph., 1894, v. 28, p. 163.
[3] Fordyce, J. A. Multiple benign cystic epithelioma. Jour. Cutan. Dis., 1892, v. 10, Dec., p. 459.
[4] McDonagh, J. E. R. Pathology of skin from the eyelids and nasofacial grooves. Brit. Jour. Derm., 1912, v. 24, p. 291.
[5] Traenkle, H. L. Epithelioma adenoides cysticum, tricho-epithelioma and basal cell cancer. Arch. Derm. and Syph., 1940, v. 42, Nov., p. 822.

ENDOPHTHALMITIS SUBSIDING AFTER TREATMENT WITH PENICILLIN*

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The prognosis in cases of fully developed suppurative endophthalmitis is grave, and, as a rule, after all therapeutic measures to save the eye have failed, evisceration must be performed. Recently, however, the introduction of penicillin offers a new therapeutic approach in the treatment of many purulent ocular conditions, as may be illustrated by the following case.

History. A man, aged 70 years, was referred to the Greens' Eye Hospital on

* From Greens' Eye Hospital.

March 22, 1944, because of inflammation of the left eye. Four years previously he had been examined by an ophthalmologist and it was found that the patient had an immature cataract in each eye. At that time the vision of the right eye was 20/30 and that of the left eye was 20/120. In April, 1940, an extracapsular cataract extraction was performed on the left eye. On the twelfth postoperative day an iris prolapse in the wound was discovered. It was cauterized several times with trichloracetic acid, which caused it to shrink to a small bleb from which there was no seepage. Four days later the vision of the left eye with correction was found to be 20/20, and the patient was dismissed by his surgeon as cured. Three months later a cataract extraction was performed on the right eye. The postoperative course was uneventful and subsequent vision of the right eye with correction was 20/30.

On admission to the Hospital, on March 22, 1944, the patient stated that six weeks previously the left eye had become inflamed. A physician had given him some eye drops which failed to relieve the irritation. Two days prior to admission, as the discomfort increased, he again consulted his physician, who diagnosed the condition as keratoconjunctivitis and prescribed sulfathiazole ointment as well as sulfathiazole to be taken by mouth. However, as the vision of the left eye became progressively more blurred, and a slight hypopyon was noted, the patient was referred to the Hospital for diagnosis and further treatment.

Examination. On admission, the left eye showed marked circumcorneal injection. The cornea was cloudy, with deep infiltration in the center, and striation of the lamellae. A hypopyon projected 1 mm. into the anterior chamber. There was marked infiltration of the conjunctival flap at the 12-o'clock position. A yellowish reflex from the vitreous was noted. Vision of the eye was reduced to light perception. Projection was faulty. A smear of the purulent contents of the cul-de-sac showed Staphylococcus albus of the nonhemolytic type. The diagnosis of endophthalmitis of the left eye was established.

Treatment and Course. The patient was hospitalized on March 22, 1944. On the first day treatment consisted of the local use of atropine ointment and sulfathiazole ointment, intravenous administration of sulfadiazine (70 c.c. of 5-percent sodium sulfadiazine solution in distilled water) and oral administration of sulfamerazine (15 grains). The condition of the eye did not improve, and the intraocular pressure increased to palpation.

On March 23d, the second hospital day, medication with penicillin was begun. The drug was administered in doses of 2 c.c. of a 10-percent solution (20,000 units) in normal saline solution, injected intramuscularly every three hours, day and night, successively, until a total of 22 injections (700,000 units) had been given in three days.

On March 25th the margin of the conjunctival flap was whitish. The cornea was still steamy, and fibrinous exudate was present in the anterior chamber. The iris was grayish and muddy in appearance, and some exudate could be noted on the anterior surface of the vitreous.

On March 26th the upper portion of the cornea appeared more transparent, and the exudative mass had decreased in size. The administration of penicillin was discontinued, and treatment with sulfamerzine, two tablets (15 grains) every eight hours orally, was begun.

On March 27th the anterior chamber was clear, and the corneal transparency had increased. The iris still appeared grayish and muddy.

On the following day the vision of the left eye had improved to perception of

hand movements before the eye. The conjunctival flap was reddish, and its margin did not appear purulent.

On March 29th the exudate had been almost entirely absorbed. The corneal transparency was markedly increased, and the structure of the iris was more distinct. The next day's examination disclosed a further clearing of the structure of the iris. The old cataract wound was free of infiltration. The tension of the eye was decreased.

On April 7th treatment with sulfamerazine was discontinued, and the patient was dismissed from the Hospital. The condition of the left eye was then as follows: Several horizontal ruptures were noted in Descemet's membrane. The aqueous was clear. The pupil was slitlike, with several synechiae. A secondary membrane of the fibrous type was present. The previous cataract wound was perfectly healed. Superficial and deep vessels could be seen in the upper portion of the cornea. The tension was normal to palpation. Vision sufficed to count fingers at 6 inches.

Summary and Conclusions. A case of suppurative endophthalmitis is reported in which penicillin was administered successively every three hours over three days, with resultant clearing of the condition. No harmful effect on the patient's general condition was observed during the administration of penicillin.

Sulfa drugs did not inhibit the development of the endophthalmitis, but proved to be a valuable complementary therapeutic agent in addition to the treatment with penicillin.

1801 Bush Street.

LUXATION OF LENS WITH VOLUNTARY CONTROL*

OTIS R. WOLFE, M.D.
Marshalltown, Iowa

AND LEO L. MAYER, M.D.
Saint Louis

Odd and curious pathologic conditions relieve the monotony of the more common eye diseases. Because of its uniqueness, we present an eye condition unlike any before recorded in the literature, as far as we have been able to discover.

Mr. M. C. B., aged 40 years, presented himself at the Wolfe Clinic on May 2, 1944, with the following history:

In 1919, while a member of the Armed Forces in World War I, stationed at Scofield Barracks, Honolulu, Hawaii, a box of dynamite caps exploded in his face. It was necessary to remove the left eye immediately in the Army Hospital. The right eye was blind and received treatment in the Hospital until January, 1920, when the patient was discharged, for vision was now good in the remaining eye. Previous to entering the Army the patient had been a boxer but had no known trauma to the eyes.

Upon his discharge from the Army the patient worked in a tire repair shop until 1927. While sparring with his brother he noted a sudden haziness of vision, although the eye had not been hit. He went to a physician in Des Moines, Iowa, whose name he does not remember. This physiican gave him a lens which "made my vision better than it had been at any time after the dynamite explosion." In 1937 he began to see colored rings around all lights, had some dimness of vision, and noted a sticking sensation in the eye. He consulted another ophthalmologist but was not relieved. Two weeks later, because of this sticking sensation,

* From the Wolfe Clinic, Eye Department, Deaconess Hospital.

he sought further medical advice and the physician gave him typhoid shots. The vision returned to near normal, but the sticking sensation became more annoying. The patient felt very definitely that a piece of metal remained in the eye, usually to the temporal side and above, but at

Fig. 1 (Wolfe and Mayer). Lens in anterior chamber

times traveled across the direction of the upper lid to the inner canthus, to return to its usual position after a short time (1 to 2 hours).

Owing to this annoying sensation and the diminution of vision, he visited a state university eye clinic in 1940. He was told the tension of the eye was raised. An X-ray study of the eye was said to be negative. He was given some drops to take home and use, and was told it would help.

Our examination revealed a corneal dystrophy, with marked clouding of the cornea, more in the entire lower two thirds and more especially in the lower temporal quadrant. Vacuoles were found in the central corneal area, and in this region an area 2 mm. in diameter stained irregularly with fluorescein. There was an abundance of new blood vessels in the lower temporal portion of the sclera running into the cornea to within 2 mm. of its center. The anterior chamber appeared deep and the pupil was small (2.5 mm.) and did not enlarge under mydriasis. The sticking sensation persisted and vision was reduced to the perception of hand motion at 2 feet.

Tuberculin tests were negative. An X-ray study of the eye showed a small foreign body localized in the temporal sclera just above midline while the patient was under our care. One day he called one of us suddenly, exclaiming, "my lens is out." Lying in the lower anterior chamber was a dirty white, sclerosed, lenslike substance approximately 2.5 mm. in diameter. On further questioning the patient stated that this phenomenon had been occurring from time to time since 1927. After some maneuvering he was able to bring this lens remnant (see figure 1) into the anterior chamber and on other occasions he was able to repeat this dislodgment at will. Figure 2 shows the lens absent from the anterior chamber; on examination it was demonstrated to be posterior to the pupil. A high plus lens did not enhance vision at either position, although the

Fig. 2 (Wolfe and Mayer). Lens absent from anterior chamber.

patient showed a +13.00D. sph. which had been given to him in 1927 but which had been of little use since 1939.

The maneuver by which he brought the lens into the anterior chamber consisted of bending directly forward and then slowly turning the head with the right side going down until a shadow made

itself apparent to him. To dislocate into the posterior chamber, the patient would lie down on the bed and raise his chin slowly upward. It was more difficult to bring the lens into the anterior chamber than to dislodge it posteriorly. Through the cloudy cornea no details of the fundus could be made out. The slitlamp beam did not penetrate into the vitreous.

Attempts have been made to get previous history and findings from places the patient had previously visited professionally. Only one answer was received, this from a state university eye clinic. At the bottom of our letter of inquiry the following was written in pencil:

OD—Dislocated lens
Secondary glaucoma
Iridocyclitis
Small foreign body in orbit
Bullous keratitis

Because of the marked corneal disturbance we are keeping the patient under observation and have not advised surgery.

REPORT OF AN EYE INJURED BY LIGHTNING

PATHOLOGIC CHANGES

LOUIS B. SHEPPARD, MAJOR (MC), A.U.S.

On August 11, 1943, the patient, aged 18 years, white, was admitted to the Station Hospital at Seymour Johnson Field, North Carolina, in an unconscious state, 15 minutes after he had been struck by lightning. Examination revealed that the patient had sustained second-degree burns to the head, involving the right eye. The subsequent ophthalmologic changes were of extreme interest. Because of the scarcity of similar reports in the ophthalmologic literature, this case was deemed worthy of record.

The patient remained unconscious for four hours following admission to the Hospital, suffering anorexia and nausea for a period of three days, with some impairment of the sensoria. The subsequent clinical course, including the healing of the second-degree burns and excepting the eye condition, proved uneventful.

Ophthalmologic findings. Twenty-four hours after the incidence of the patient's injury, examination of the right eye revealed a marked edema of the upper and lower lids, moderate chemosis of the conjunctiva, and complete external ophthalmoplegia. The pupils were moderately contracted and equal in size. The cornea showed a wedge-shaped, whitish-gray opacity, extending from the 8- to the 10-o'clock position, with the apex in the pupillary region. This area did not stain. Two days later, on slitlamp examination, cloudiness was noted in the posterior half of the cornea. Vision in the right eye was light perception only and there was poor projection to light in the superior and temporal fields. The media were clear at this time.

Examination of the fundus, through a dilated pupil, indicated the loss of retinal transparency due to an edema surrounding the optic nerve which was most pronounced on the nasal side (fig. 1). No hemorrhages nor exudates were seen, and the vessels appeared normal in caliber. The intraocular pressure was normal to palpation and remained so throughout the period of observation.

Course. On the fifth day of hospitalization, the lids, conjunctiva, and cornea were clear. No lens nor vitreous changes were noted. The fundus revealed an increase in the retinal edema of the nasal and inferior portions. Projection continued poor in the superior and temporal fields. The functioning of the ocular muscles was normal. Vision in the right eye was perception of fingers at five feet; in the left eye, 20/20—3. The visual fields

of the left eye were normal and remained so throughout the period of observation.

On the fourteenth day of hospitalization, vision of the right eye was 20/200. At this time the patient had become ambulatory.

On the twenty-ninth day of hospitalization, vision in the right eye was 20/200; in the left eye, 20/20. Reëxamination of the fundus of the right eye revealed a whitish band in the posterior vitreous running vertically for a distance of 1½ disc diameters above the nerve to a distance of 2½ disc diameters below the nerve. This band had several small fibrils extending nasally and, apparently, attached to the retina. There was an area of retinal detachment 2 to 3 diopters in elevation adjacent to the nasal side of the nerve. There were two small, irregular, yellowish-white patches of choroiditis in the area of retinal edema at the inferior portion of the fundus (fig. 2). The visual field remained unchanged.

The patient was promptly confined to bed with pinhole glasses in place and sandbags to each side of his head. Forty-eight hours later, the detachment was in place and the retinal edema had diminished.

At this time a circular area of redness was noted about the macula. The patient continued abed. The vitreous band decreased in size and shifted slightly toward the inferior temporal quadrant.

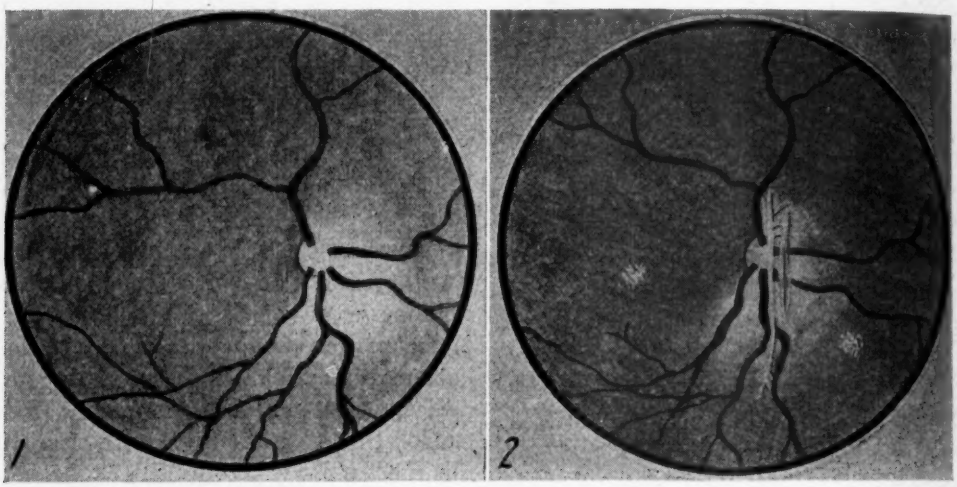

Fig. 1 (Sheppard). The fundus 24 hours after injury, showing edema of the retina involving chiefly the nasal and inferior portions adjacent to the optic nerve.

Fig. 2 (Sheppard). The fundus on the twenty-ninth day of hospitalization, showing a posterior vitreous band with fibrils extending nasally, edema of the retina, a small area of detachment adjacent to the nasal side of the nerve, and two separate areas of choroiditis.

On the forty-fifth day of hospitalization, a second detachment was noted in the inferior portion of the retina with 6 to 8 diopters of elevation. The vitreous band had several small fibrils extending to the detachment. There was an increase in the clouding of the posterior vitreous. The nerve head continued to appear normal in color (fig. 3). For the first time, small irregularly shaped opacities were seen in the posterior cortical layers of the lens. Projection was definitely decreased in the superior fields with vision decreased to the perception of fingers at five feet. At this time it was deemed ad-

visable to transfer the patient to a general hospital for further observation and treatment.

The patient was admitted to Moore General Hospital on September 26, 1943. The subsequent course of his progress was reported by the medical staff of that Hospital as follows: His course was uneventful until October 26th, when the right eye became painful and red. The diagnosis of acute iridocyclitis was made. The aqueous was turbid, with many cells floating in the anterior chamber. The iris was boggy. Several posterior synechiae were noted and K. P. deposits were found on Descemet's membrane. The patient was given the usual local treatments with atropine and hot applications. Artificial-fever-cabinet therapy supplemented the foregoing. After two weeks of treatment, the inflammation gradually cleared.

In the search for foci of infection, a mild prostatitis was found and eliminated. No surgery was advised for the retinal detachment because of the associated inflammatory processes.

The patient was returned to the Station Hospital at Seymour Johnson Field on December 22, 1943, for rehabilitation. On examination of the right eye at that time, the following observations were made: Vision in the right eye was perception of fingers at two feet; in the left eye, 20/30+2. The right eye had 15 degrees of divergence. Light projection was absent in the superior quadrants. The patient could distinguish hand movements in the lower temporal quadrant and only strong light in the lower nasal quadrant. The fundus of the right eye could not be clearly discerned due to an increase in the posterior cortical opacities of the lens and the vitreous opacities. However, a complete detachment of the inferior retina was visible (fig. 4).

The patient was discharged to light duty on December 27, 1943, on the 136th day after the injury.

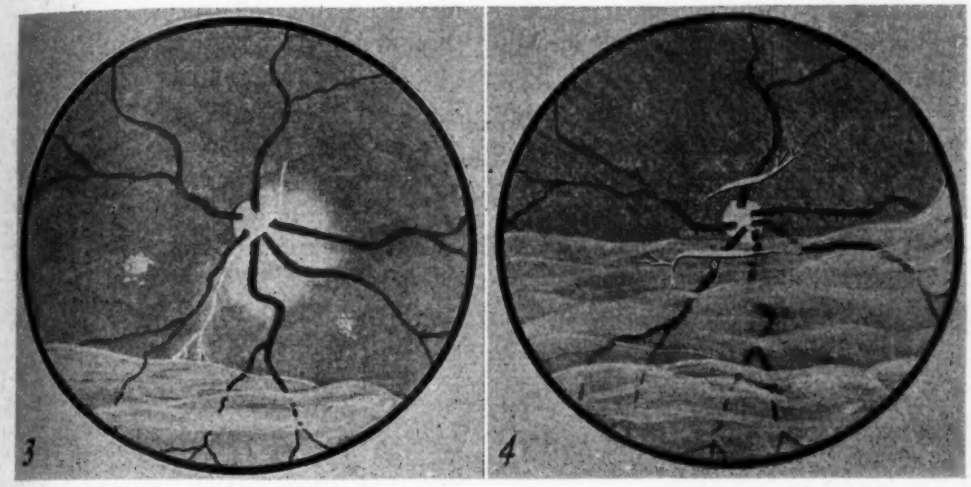

Fig. 3 (Sheppard). The fundus on the forty-fifth day of hospitalization, showing the posterior vitreous band with fibrils extending to the detachment of the inferior retina.

Fig. 4 (Sheppard). The fundus on the 136th day of hospitalization, showing a huge detachment of the retina of the inferior fundus. Several strands of fibrous tissue (retinitis proliferans) are seen.

Comment. Haab,[1] in 1888, and Oliver,[2] in 1896, each reported a case of retinal changes following flashes of lightning which terminated in blindness. In the British Journal of Ophthalmology, 1929, J. N. Roy[3] reviewed two such cases. The first, that of a girl aged 11 years, described a severe bilateral neuroretinitis following exposure to several flashes of lightning. Blindness resulted. The second case was that of a boy, aged 12 years, who was stunned by lightning and later showed ophthalmologic changes resulting in optic atrophy.

Two causative factors should be considered in evaluating the progressive organic changes observed in the present case. One of these factors may be photochemical action; the other, a thermal action or, more likely, a combination of both. The posterior-vitreous changes with the resultant band formation suggest that there was organization following coagulation of the posterior ocular structures. It is probable that the vitreous band was attached to the retina and its contraction may account for the detachment. Since there were areas of exudation, it is also probable that these may have been a factor in causing detachment.

REFERENCES

[1] Haab. As quoted by Roy, Dunbar. The effect of intense flashes of electric light upon the eye. Amer. Jour. Ophth., 1897, v. 14, p. 353.

[2] Oliver, C. L. A clinical study of a case of double chorioretinitis, in the macular region, following a flash of lightning and a flash from burning lycopodium. Trans. Amer. Ophth. Soc., 1896, v. 7, p. 613.

[3] Roy, J. N. A case of monocular blindness of electrical origin. Brit. Jour. Ophth., 1929, v. 13, p. 490.

THE SINISCAL-SMITH LID EVERTER*

ARTHUR A. SINISCAL, M.D.
Rolla, Missouri

A new type of instrument† for everting the upper eyelid is presented herewith. It is hoped that this will fill a long-desired need in the ophthalmologist's armamentarium by affording a quick and simple means by which the upper lid can be everted and the underlying conjunctiva widely exposed to view, displaying the retrotarsal fold and the whole upper cul-de-sac with a minimum of discomfort to the patient. The instrument is an outgrowth of the glove-buttoner which was used in the Trachoma Clinic in Rolla, Missouri, many years ago and which was later reshaped by one of the co-designers‡ into a more suitable form for everting the upper lid and examination of the cul-de-sac; from this, it was redesigned by the writer into the present model and presented to the ophthalmic profession for more general use. The instrument will supplant some of the older types of lid instruments used, most of which are primarily lid *retractors* and not suitable for routine use in the office or clinic as lid everters. Because of their bulk, or complex design, many of the older instruments used for lid everting become too unwieldy for everyday use, and, even when carefully manipulated, the lid integument occasionally became traumatized. For these reasons, and also because

* From the Missouri Trachoma Hospital. (Division of the Missouri State Board of Health).

† Manufactured by Storz Instrument Company, 4919 Forest Park Blvd., Saint Louis, Mo.

‡ J. E. Smith, M.D., Huntsville, Alabama.

they were the source of general discomfort to the patient, many of them failed to gain popularity.

The lid everter illustrated here (fig. 1) does not injure any of the lid structures, even when marked pressure is applied. By moving the handle from side to side, once the instrument is in position, in order to slide the loop along the skin surface from inner to outer canthal angles, all of the upper extensions of the conjunctival fold can be exposed to view. Its employment facilitates not only the examination of the inner recesses of the conjunctiva—useful, for example, in doubtful diagnosis of the conjunctivitides — but also the search for foreign bodies that may have become lodged beyond the tarsal border; it aids in routine examination; in the demonstration of anatomic relationships; and also in the employment of surface applications of therapeutic agents. When used for this latter maneuver, the instrument can be held entirely in the left hand (vide infra), leaving the right hand free for holding applicators or therapeutic solids, as, for instance, in the application of carbon-dioxide snow to the follicles of vernal catarrh.

Fig. 1 (Siniscal). The Siniscal-Smith lid everter.

The instrument, having only one end for use, is simple in action and control. It is held by its handle (corrugated) in the vertical position, with the concave side of the loop facing forward (fig. 2). The *right* hand holds the instrument, with its loop placed against the skin of the lid, well behind the upper tarsal edge, and, while grasping the ciliary margin between the thumb and forefinger of the *left* hand, one directs the patient to look down. By pushing down on the instrument handle while at the same time lifting the lid margin, a wide exposure of the underlying conjunctival surface is obtained (figs. 2 and 3). The extent of surface exposure can be controlled by the amount of pressure and counterpressure exerted on the instrument and lid margin, respectively. Figure 3 illustrates the everted lid held in place by the instrument, which is now

Figs. 2, 3, 4 (Siniscal). Application and use of the everter.

held entirely by the *left* hand, with the handle fixed between the middle and ring fingers; this leaves the right hand free to apply medications (fig. 4), or for instrumentation, demonstrations, and the like.

Occasionally, a foreign body becomes lodged or embedded in the upper fornix of the conjunctiva, and escapes notice, during the regular search for its presence by mere eversion of the upper lid with an applicator handle, pencil, or some blunt instrument. In the author's experience the following interesting case was observed: A child was brought in to the Clinic for a supposed active stage of trachoma in one eye, showing a moderately swollen upper lid with deeply injected conjunctiva generally and especially in the upper limbus region. Upon careful examination of the upper recesses of the cul-de-sac, there was found to have lodged therein a cockle-bur which had become so deeply embedded as to have eluded discovery during previous routine examinations. A similar experience occurred in the hands of a colleague, who found in his particular instance a small splinter of wood lodged in the upper cul-de-sac and so well encapsulated that it made discovery almost impossible until a wide exposure of the fornix was obtained by marked eversion of the lid.

Trachoma Hospital.

REFRACTION CLINIC*

DISCUSSION BY ALBERT E. SLOANE, M.D.†
Boston

A housewife, aged 36 years, entered the hospital with many varying asthenopic complaints, which did not include diplopia but indicated that her eyes were never comfortable. Seven years ago she was operated on for alternating esotropia. One year ago, an alternating exotropia was noted, for which a tenotomy of the external rectus of the left eye was performed, following which she got a good cosmetic result. However, her symptoms persisted. She was working in a factory, operating a weaving machine that required precise fixations at several fixed distances. It was this kind of work that fatigued her most.

EXAMINATION

Vision was R.E. 20/30; with a +1.50D. sph. ⊂⊃ −0.50D. cyl. ax. 180° it was 20/20. Vision L.E. was 20/70; with +1.50D. sph. ⊂⊃ −0.50D. cyl. ax. 60° it was 20/40+. The Maddox rod test revealed a hyperphoria of 5Δ for distance and near in the right eye, and in the left eye an exophoria of 4Δ for distance, 12Δ for near.

The afterimage test showed both normal and anomalous retinal correspondence.

The cover test showed an esophoria for near and distance.

Glasses were ordered incorporating a total of 3Δ divided between the two eyes partially to correct the vertical hyperphoria. She reported later that relief was not obtained. Base in prisms were given on two occasions but afforded no relief. Subsequently glasses were prescribed without prisms and again without relief.

DISCUSSION

I believe that we may eliminate the compound hyperopic correction as being the source of her trouble on the basis that the glasses were correct. It is safe to accept that a patient subjected to at least six tests of her refraction has proper glasses. This brings us to the muscle-balance situation. Some questionable features are encountered at this point: 1) An operation for alternating esotropia

* From the House Officers' Teaching Clinic, Massachusetts Eye and Ear Infirmary.
† Director of Department of Refraction.

does not generally restore binocular vision since binocular vision is not the picture of a true alternating esotropia. This is further borne out by the fact that an exotropia developed postoperatively since there was no binocularity to fixate the eyes and maintain them in the normal integrated position. Again, if the binocular problem were the basis of her trouble we would expect periods of diplopia, since 5Δ of vertical error cannot easily be fused. All this would tend to argue against a heterophoria as the cause of the trouble. One test serves to uncover the true nature of this patient's binocular status. It was noticed that the eyes were cosmetically straight but that the cover test showed an esotropic condition both for near and distance. In spite of this esotropia noted objectively, the patient consistently showed an exotropic condition with the Maddox rod. Thus the patient had a convergent strabismus by cover test and a divergent strabismus according to the Maddox rod. The explanation for this lies in the fact that this patient has a well-marked anomalous retinal correspondence which was well developed and present for a long time. In this situation it is almost as though there were a false macula in the deviating eye. When the operations were carried out to correct this primary esotropic condition they were, strictly speaking, inadequate to correct it all, since an esotropic condition still existed as demonstrated by the cover test. However, the same operations went too far, inasmuch as they produced an exotropia. This could only be possible where the projection did not correspond to the position of the eyes. This condition is known as paradoxic exotropia. It is not amenable to correction with prisms or exercise and is best treated by ignoring the muscle condition. The aim should be to obtain a beneficial cosmetic result. Eventually suppression will adequately eliminate the symptoms.

Questions

Q. Would you expect the symptoms to be relieved by occlusion of one eye and would this not be a good diagnostic test?

A. I would not be surprised if the binocular symptoms did disappear, but I do not believe it is necessarily a diagnostic test.

Q. Why does the patient have discomfort if no single binocular vision is present?

A. Because in most cases of strabismus the suppression area of the deviating eye does not include the peripheral field; the new position of the two eyes may produce discomfort by the new relationship acquired by the peripheral fields.

Q. What is the significance of anomalous retinal correspondence?

A. This indicates that corresponding anatomic retinal areas do not correspond functionally; that an anomalous functional integration has been set up according to the nonparallel position of the two eyes. In this way the person with strabismus has no diplopia and still a full binocular field of vision.

Q. How could you get a Maddox rod reading if no binocular vision were present?

A. Very often the two eyes alternate so rapidly that the person may project as though he saw both images simultaneously.

243 Charles Street.

CORNEAL FORCEPS: NEW TYPE

Walter Moehle, M.D.
Brooklyn, New York

The popularity of corneal sections closed by means of suture in the technique of cataract extraction has introduced various designs of forceps for the purpose of adequately grasping the corneal lip. The construction must be such that the

instrument maintains the corneal lip firmly for the placement of the suture without traumatizing the tissue. The majority have the disadvantage of sharp intermeshing teeth where the pressure of the eliminates these difficulties. Each tip has a single tooth, 1 millimeter long, 1 millimeter wide, and 0.5 millimeter high; they are angulated at 45 degrees, wedge-shaped, and have a semi-sharp edge. Of

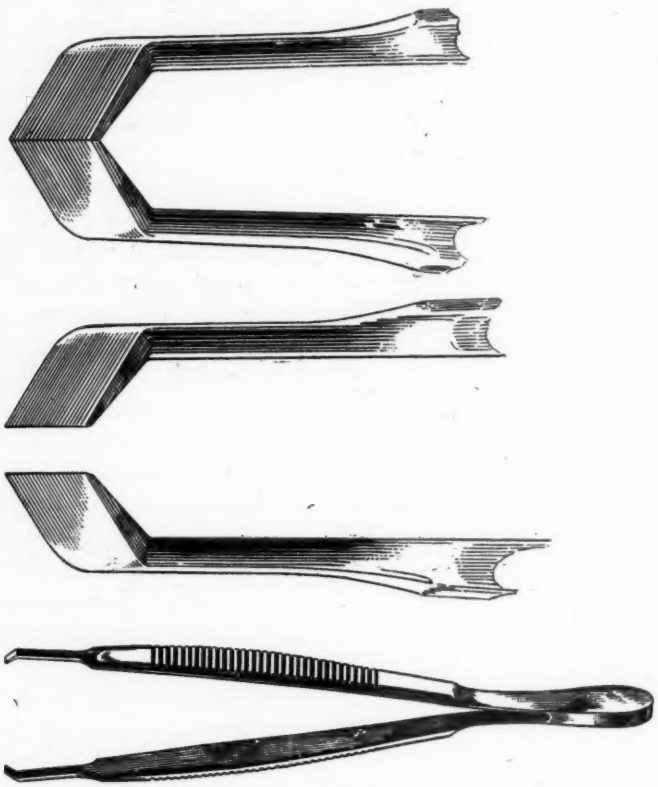

Fig. 1 (Moehle). Corneal forceps: new type.

bite of each tooth of the tip is not directly opposite in its grasp. Teeth which accurately oppose each other obviate this.

I have obtained satisfactory results with a simply designed forceps* that most importance is the fact that the edges of the two teeth directly oppose each other, so that, when in use, the pressure on the corneal lip permits a firm vicelike grip but does not tear nor bruise the tissue.

15 Schermerhorn Street.

* Made by Wm. Langbein & Brothers, Brooklyn, New York.

SOCIETY PROCEEDINGS

EDITED BY DR. DONALD J. LYLE

SEMI-ANNUAL MEETING OF THE DEPARTMENT OF OPHTHALMOLOGY, THE GEORGE WASHINGTON UNIVERSITY SCHOOL OF MEDICINE

December 4, 1943

DR. WILLIAM THORNWALL DAVIS,
Executive Officer
Washington, D.C.

The semi-annual meeting of the Department of Ophthalmology of the George Washington University School of Medicine opened with the presentation of cases by the staff of the Department of Ophthalmology. A paper on "Military aspects of ophthalmology" by Col. Frederic H. Thorne (MC), U.S.A., followed, after which Dr. William Thornwall Davis presented a motion picture of the disturbances of the vertical ocular motility. The meeting was concluded with the case discussions.

MILITARY ASPECTS OF OPHTHALMOLOGY (Abstract)

COL. FREDERIC H. THORNE (MC), U.S.A., stated that except for correction of refractive errors the extent of ophthalmic practice in the Army equals about that which was estimated before the United States entered World War II. Battle casualties are not included. At one station through which 136,000 trainees passed during a 12-month period, 613 ocular operations were performed, 304 were hospitalized for ocular disorders, and 11,996 were refracted and spectacles issued.

Visual requirements for general military service are 20/200 bilateral, correctible to 20/40 or better. However, before a man can leave for overseas duty his vision must be corrected to 20/40 or better and he must have in his possession two pairs of spectacles. Gas-mask-type spectacles must also be issued when binocular vision is less than 20/70.

The forced-refraction program has been unsatisfactory because of: (1) a lack of available medical officers trained in refraction; (2) the difficulty in keeping spectacles on those required by regulations to wear them; and (3) the inability of the contracting optical firm to furnish the spectacles in sufficient time to prevent clogging of the flow of the personnel through the various training centers. Because of the lack of medical officers, the bulk of the refraction work has fallen on the shoulders of the enlisted optometrists, supervised by a medical officer.

It is believed that the forced issue of spectacles should apply only to those who have a visual acuity of less than 20/100 and to those who are undertaking specialized training of one type or another, and its successful pursuit depends largely upon visual acuity. Permission should also be given to issue spectacles to those who exhibit asthenopic symptoms, provided, in the opinion of the examiner, spectacles are necessary.

Overall supervision of ophthalmology in all branches of the Army by an officer familiar with present-day problems is recommended. This officer should be stationed in the Surgeon General's office and be made responsible, under the Surgeon General, for the assignment of personnel and the coördination of all ophthalmic activities.

Since the bulk of refractions falls upon the shoulders of enlisted optometrists,

these men should be given adequate recognition, and it is recommended that those qualified be given a rating of Warrant Officer, Junior Grade.

Discussion. It was asked, with respect to the men who report at the time of induction for examination, and on whom it is customary for the technicians to get the best possible vision no matter how hard they have to "squeeze," what the outcome is when these men get in the Army.

Colonel Thorne replied that it is difficult to answer that question. So many men get in with very poor vision even though their induction examinations showed that they had normal vision. That applies usually to squint cases. As is known, a squint can be alternating or intermittent, but if it is a one-eyed squint, the vision in one eye cannot be corrected, but on the induction papers the findings show that there is normal vision in each eye. He said he thought that "squeezing" vision is fair enough; that is, if there is adequate vision for ordinary purposes. The induction centers encounter the same trouble that examiners have everywhere to get the men to read the chart so that the maximum visual acuity is obtained. They refuse to make any effort and it is practically impossible to obtain it on the mass population who go through the induction centers. There are a great many men to examine and pressure is exerted on them to either pass or reject them. It is impossible, therefore, to examine these men with great care and still hurry them through.

During the time from September, 1942, to about February, 1943, men were sent to the station hospital to which I was attached by their induction boards; the halt, the lame, and the blind. They even sent in a man with a broken back in a plaster cast. In the last few months apparently they are not being so hurried at induction centers, as the examinations are being more carefully made. When a man is sent in now whose record says he has 20/50 or 20/70 vision, it can usually be accepted as accurate.

It was then stated that the question asked was intended to refer to the myopic. The technician examines them and records the vision obtained by squeezing their lids.

Colonel Thorne said he thought that if they have 20/200 vision with squinting they should have less than 20/200 without squinting or squeezing. This could not be classified as useful vision and he would say that they should not be allowed to stay in the Army.

Colonel Thorne was then asked regarding the number of refractions done under a mydriatic.

He said the great majority are done under a cycloplegic but now when a man is examined who is easily corrected with −0.50D. sph. or −1.00D. sph., that completes the examination. But for all practical purposes it can be said that all are done under cycloplegia. Five-percent homatropine is the cycloplegic used. In all probability it is not necessary in all cases.

Disturbance of the Vertical Ocular Motility

Dr. William Thornwall Davis presented a motion picture to illustrate this subject. "By far the most frequent and important type of paralysis of a single vertical motor anomaly is trochlear-nerve palsy" (Bielschowsky). Most statistics give too small a number of trochlear pareses because they are not recognized. It occurs at least half as often as abducens pareses, which is the most frequent of all.

The most striking sign is habitual torticollis; that is, a tilting of the head to one shoulder. This occurs only when the

oblique muscles are involved, either the superior or the inferior oblique; it does not occur when the superior or inferior recti are paretic. It is the two symptoms, torticollis and upshoot of the eyes with the head tilted to one shoulder, that present the distinguishing differences.

The differential diagnoses (torticollis and the upshoot of one eye with the head tilted to one shoulder) were demonstrated in a motion picture in a case of right superior-oblique paresis. This showed the characteristic posture of the head, or torticollis, and also the upshoot of the right eye with the head tilted to the right shoulder, but no upshoot with the head tilted to the left shoulder. A case of left superior-rectus paresis was also shown, which showed no upshoot of either eye with the head-tilt test.

Anomaly of the optic disc

Dr. Ernest Sheppard presented the following cases:

Case 1. This patient was a man, aged 42 years. The vision in the left eye was 20/200 with −1.00D. sph. ⊂⊃ +2.75D. cyl. ax. 90°. The history of always having had poor vision of the left eye was confirmed by available records. When first examined in February, 1942, the disc was elevated 4 diopters and so pigmented on the nasal side that the margin was not visible. There was less dense pigmentation extending 1 disc diameter nasally. There was a small striate retinal hemorrhage adjacent to the upper nasal border. The temporal half of the disc showed slight pigmentation. There was a large temporal choroidal crescent and also a patch of choroidal atrophy at the upper temporal edge. The elevation extended almost to the macular area, as described by Klien (Arch. of Ophth., 1936, v. 16, p. 624, case 8). The right eye was normal. The exophthalmometer readings were 23 mm., each eye. The tension was 22 mm. Hg (Schiötz), each eye. The physical examination was normal. Roentgenograms of the chest, skull, sella turcica, and the optic foramina were normal. He showed a slight reaction to old tuberculin 1:10,000. The blood Wassermann reaction was negative. The tentative diagnoses were: (1) developmental anomaly (as described by Mann in "Developmental abnormalities of the eye," Cambridge Univ. Press, 1937, pp. 127 and 133); (2) choroiditis juxta papillaris of Jensen, of undetermined etiology.

It was asked whether there was any suggestion of a retinal septum or congenital septum, or if there was some tearing of the retina which might be a retinal septum extending a short distance behind the disc. This condition is described by Ida Mann.

Dr. Sheppard replied that there was no septum so far as he could determine. The patient was examined both with the Friedenwald ophthalmoscope and with the Gullstrand binocular ophthalmoscope and there was no septum nor were there any prepapillary membranes such as are seen in proliferative retinitis.

Case 2. This patient was a five-year-old boy on whom a history of left convergent strabismus since birth was obtained. The visual acuity was 2/200, left eye, with +5.50D. sph. ⊂⊃ +1.00D. cyl. ax. 90°. The disc was elevated 4 diopters and obscured by gray tissue. There was a large scleral ring surrounding the disc. There had been no evidence of inflammation and no change in the appearance in 18 months. With occlusion the visual acuity improved to 20/70+2. The visual fields, as nearly as could be determined, were normal. A tentative diagnosis of developmental anomaly was made.

The possibility of malignancy in each case was considered.

Pemphigus of the conjunctiva

Dr. E. Leonard Goodman presented Mrs. E. B. P., a white woman, aged 59 years, who was first seen in September, 1936, at which time she complained of having had a "cold" in each eye for the previous two months. No previous history of ocular pathology was given. The patient suffered some discomfort but no actual ocular pain. There was no increase in tears, but some increase in mucous formation.

Examination showed the palpebral conjunctiva of both lower lids to be thickened and boggy red with a thick gelatinous, pseudo-membrane in some areas. No bullae were present. A diagnosis of chronic muco-purulent conjunctivitis was made and zinc and argyrol solutions were ordered.

The patient returned three months later with an aggravation of her symptoms and beginning evidences of scar tissue formation in the conjunctiva of the lids and retrotarsal folds. A working diagnosis of pemphigus of the conjunctiva was made. There were no lesions of the skin or other mucous membranes present.

Laboratory findings were as follows: (1) conjunctival smear—few pus cells, few epithelial cells, and staphylococci; (2) urinalysis—negative; (3) Wassermann—negative; and (4) tuberculin reaction (intradermal)—negative. The patient's diet was lacking in green vegetables and milk.

Medication prescribed was: (1) series of ultraviolet (cold quartz) irradiations; (2) Fowler's solution internally; (3) cod-liver-oil concentrate; (4) calcium lactate; (5) liquid petrolatum and 1: 8,000 mercurophen locally; and (6) correction of diet.

The acute inflammatory symptoms soon abated but symblepharon formation in both lower cul-de-sacs, most marked in the nasal corners, became rapidly more marked in the succeeding three months.

The patient was seen again after a period of six years. She stated that the redness of her eyes had disappeared during this period except occasionally, until one month ago when the right eye again became persistently inflamed. The lower cul-de-sac on the right side was now obliterated nasally and on the left showed heavy cicatricial bands. The cornea in each eye was, so far, unaffected. The patient did not complain of tearing.

It was asked whether any surgery to relieve the adhesions would be indicated now that the case was in a quiet stage.

Dr. Goodman said that this patient came to him as a last resort about three years ago with that same question and he did not recommend surgery. He did not think she had enough symptoms to warrant surgery and if very careful surgery were attempted, the benefits obtained would not justify it. Unless her symptoms become worse, or the cornea becomes involved, he said he would not advise surgery.

Retinal detachment in childhood

Dr. Frank D. Costenbader demonstrated two cases of retinal detachment occurring in children under the age of 15 years. It was noted that the incidence of retinal detachment during the first two decades of life is less than 0.02 percent according to Stallard, Lindner, and Arruga.

Case 1. A white boy, aged nine years, showed upon examination a large bilateral bullous detachment of the entire inferior retina of the left eye, presumably following a blunt blow eight months previously. No hole was demonstrated. Two operations resulted in an incomplete reattachment, remaining detachment being limited to the peripheral inferior retina. The visual fields, greatly reduced

before operation, showed only a restriction of 10 degrees in the superior peripheral field after surgery. Almost complete activity had gradually been resumed without additional detachment. Central vision was 20/70 corrected. Possible causes of incomplete cure considered were: (1) retinal bands and (2) choroidal tumor, although transillumination of the sclera had been constantly good.

Case 2. A white girl, aged 12 years, had an extensive detachment of the entire inferior retina in the right eye without demonstrable cause other than myopia. Two operations resulted in a complete reattachment with almost complete restoration of the peripheral visual field, and the final corrected vision was 20/50+. The left eye showed a detachment of the inferior temporal and a portion of the inferior nasal retina 16 months after the retina of the right eye became detached. The left eye was not operated upon, but physical activity was restricted and atropine instilled. The retina restored itself over a period of 16 months, even though physical activity was resumed. Final examination of the left eye revealed corrected vision of 20/30, peripheral visual fields restricted 5 to 10 degrees superiorly, and no evidence of residual detachment. It is interesting to note that both eyes were myopic. No tears or disinsertions were ever demonstrated. No evidence of intraocular inflammation was present except fine strands in the vitreous. All tests for acute or chronic systemic infections were completely negative.

It was asked, with regard to the second case, what the indications were for surgery on the one eye and the contraindications for surgery on the other eye with the same condition.

Dr. Costenbader said that the reason for not operating on the second eye was the objections of the parents. They did not wish to have the other eye operated upon. With no treatment except reduced activity reattachment took place.

Bilateral amblyopia due to incomplete optic atrophy following crushed chest

Dr. Ronald A. Cox presented the case of a Marine who gave a history of having sustained injury when a jeep accidentally overturned, crushing his chest and causing massive internal hemorrhages. The patient was unconscious for three days and upon awakening was bilaterally blind. The peripheral areas cleared gradually in both eyes but large central scotomata remained, and the patient was centrally blind (20 months after injury).

Conclusions. From careful study of the case and the literature, the conclusions are: (1) That massive loss of blood from the body may cause serious loss of sight; although the patient may recover, with complete recovery from the anemia, the blindness is permanent. (2) That the evidence afforded by the ophthalmoscope points to thrombosis of the central retinal artery as the usual cause of the blindness that occurs in posthemorrhagic anemia. (3) That the blindness is due to degeneration of the retinal ganglion cells, together with their long processes which make up the centripetal fibers of the optic nerve, and that the diminution in size of the vessels is a result of and not the cause of the blindness.

Foreign body in cataractous lens located by Vogt X-ray technique

Dr. Richard W. Wilkinson said that Mr. J. D., an automobile mechanic, aged 34 years, on July 8, 1942, was tapping a piece of steel with a hammer and something flew into the right eye. He was seen on July 9th at which time the injury appeared as a small superficial

abrasion near the center of the cornea. No foreign body was found at the time of injury. Within three days there was complete healing and the patient was discharged.

Three weeks after the injury he was inducted into the Army, passing all visual tests. In December, 1942, five months following the injury he noticed that the vision in the right eye was blurred and upon reporting to the Army doctors a diagnosis of traumatic cataract was made. He was studied at Fort Wayne and later at Atlantic City where several sets of X rays were taken in the usual way. However, no foreign body was found. There was no "pull" felt when the magnet was applied.

The patient was seen again in April, 1943, at which time there was a fully developed cataract in the right eye. Light projection was good. The pupils were equal, and reaction to light normal. Examination of the cornea showed a thinly veiled scar above the center which appeared, with the slitlamp, to be a penetrating wound. There was no evidence of injury to the iris. No definite tear could be made out in the lens capsule. The left eye was normal, vision 20/15.

The patient was referred to a local roentgenologist and again the report was "examination of the right orbit fails to demonstrate evidence of an opaque foreign body."

As this was a compensation case and in view of the length of time that had elapsed since the injury and the diagnosis of traumatic cataract made, the patient was referred to Dr. Jonas Friedenwald, who, in turn, referred him to Dr. Maurice Feldman for X rays. Using the Vogt technique, Dr. Feldman found a minute opaque foreign body located apparently near the posterior surface of the lens.

In the summer of 1943, the patient was discharged from the Army, and in September an extracapsular cataract extraction was performed, and the piece of metal was recovered from the lens substance. The patient made an uneventful recovery and the corrected vision was 20/20.

This case demonstrates the value of the Vogt technique where other methods of localizing the foreign body fail. A "bone-free" film, usually a dental film, is placed nasally to the eyeball and pressed deeply into the orbit, and soft roentgen rays are directed from the temporal side. The anterior segment is nicely presented without interference by the orbital bones. The X ray will show particles of metal, glass, cement, or stone in the anterior segment of the eye which are frequently not seen by other methods.

X-ray films were demonstrated showing a foreign body.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

December 21, 1943

DR. PAUL A. CHANDLER, *presiding*

PENICILLIN IN OPHTHALMOLOGY

DR. LUDWIG VON SALLMANN presented a paper on this subject. He said that studies on the toxicity of penicillin for the eye revealed that solutions or ointments containing 0.25-percent sodium penicillin (about 300 Oxford units per cubic centimeter) were well tolerated by rabbit and human eyes in various types of application. Solutions of higher concentrations damaged the epithelium of the rabbit cornea. Frequent and continued instillations, the application of salves, corneal bath, and iontophoresis were studied. The concentration of penicillin in the aqueous after local and systemic treatment was highest by far with the ioniza-

tion method, moderate with corneal bath, and small with intramuscular injection. Penicillin was usually not detected in the aqueous after frequent and prolonged use of salves and instillations. The addition of two wetting agents, aerosol 1B and penetrasol B, did not change these results. Nor did the wetting agents increase the permeability of the cornea beyond that obtained with local anesthesia.

The effect of local penicillin on intraocular infections with three types of pneumococcus (types III, VII, and X), two strains of mannitol-positive Staphylococcus aureus, and two strains of Cl. welchii was studied and compared with the result of iontophoretic introduction of sodium sulfadiazine combined with the systemic use of the sulfonamide compound. In most series of experiments the lens was injured during the inoculation of the dilution of the culture into the anterior chamber. Penicillin therapy was greatly superior to the combined sulfadiazine treatment in checking acute infections with pneumococci and staphylococci. Penicillin was also effective in the treatment of pneumococcic infections when the interval between the inoculation and treatment was extended to 12 and 13 hours. Dilutions of Cl. welchii cultures were injected directly into the lens. This infection was not influenced by any treatment when it began six hours after inoculation.

Dr. Von Sallmann further stated that a limited number of clinical observations at the Institute of Ophthalmology and experimental data obtained on acute intraocular infections with penicillin-sensitive organisms indicate that treatment should be started as early as possible and before the suppuration of the anterior segment of the eye has reached a peak.

Dr. Von Sallmann was asked whether or not penicillin could be used in the treatment of vitreous conditions, to which he replied that no penicillin was found in the vitreous after local and systemic introduction of penicillin.

Mahlon T. Easton,
Reporter.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

January 18, 1944

Dr. Paul A. Chandler, *presiding*

Surgical treatment of tumors of the lid margins

Dr. Algernon B. Reese read a paper on this subject and presented slides to demonstrate his technique.

Dr. Reese said that surgery is preferable to irradiation in the treatment of most cases of epithelioma of the lid margins. He described two techniques in which he found satisfaction. One is indicated when approximately one third or less of the length of the lid must be resected and the other when more than approximately one third of the length of the lid must be resected. The principle of both procedures is a sliding graft from the temple. Some advanced cases of epithelioma of the lid should be treated by irradiation and surgery. These operations were also useful in the treatment of nevus of the lid margin and for the repair of postirradiation defects of the lid margin, congenital coloboma, and traumatic coloboma.

Dr. Reese said that for the treatment of a papilloma, excision with cauterization of the base is adequate because the lesion does not spread beneath the skin surface. Hemangioma is a nonprogressive type of lesion, and usually repeated injections of 5-percent sodium morrhuate is sufficient. For precancerous melanosis irradiation is indicated and for cancerous melanosis usually exenteration.

Question: If you have done an operation and you feel irradiation should be used, how soon after operation would it be advisable to use the X ray to a fair extent?

Answer: Dr. Reese said he knew of no case in which he had used irradiation after operation. He saw no reason why it should be carried out immediately.

Question: What should be done with very small epitheliomas such as one sees in private practice?

Answer: Dr. Reese said he thought that if the lesion is an epithelioma it would require resection of one third the length of the lid, and the simpler procedure is indicated.

Question: Most hemangiomas we see are in young infants. Is any treatment necessary for these? If you do undertake treatment do you do it right away or do you wait a certain length of time, and, if so, how long?

Answer: There is a general rule for hemangiomas and that is the earlier they are treated the more sensitive and responsive they are to treatment. Radiation or sclerosing solution is used. Therefore, Dr. Reese said he thought the sooner you get after them the better.

Dr. Reese concluded by stating that the point he wanted to emphasize is the fact that these cases should be handled by ophthalmologists and that surgery gives the best result; that he saw no reason why ophthalmologists cannot treat them more satisfactorily than any other group.

Mahlon T. Easton,
Recorder.

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ACCEPTABLE PRACTICES FOR DISPENSING GLASSES

One of the most controversial problems that has confronted ophthalmologists throughout the years and seems today no nearer solution than it did 50 years ago is how to have the prescription for glasses for their patients filled in a satisfactory and ethical manner. Even the most acceptable practice—namely, that of referring the patient to a dispensing and nonrebating optician—has drawbacks and when one realizes that such opticians are available to only a few ophthalmologists, the impossibility of considering referral to such as the only sound practice becomes patently absurd. Can one say that because there may happen to be a dispensing optician available he must be employed by the ophthalmologist? Suppose he is distasteful to him in other ways, even if ethical!

The writer has searched in vain for specific statements of policies enacted by the House of Delegates of the American Medical Association in regard to these matters. The ruling cited below applies to rebating only. It is enlarged upon in a "Report of the Reference Committee on Amendments to Constitution and By-Laws" in 1942, p. 70, adopted by the House of Delegates, but this also fails to refer specifically to the problem that concerns the ophthalmologist.

In Chapter III, Article 1, Section 5, of the Principles of Medical Ethics of the

American Medical Association it is stated "It is unprofessional to accept rebates on prescriptions or appliances or perquisites from attendants who aid in the care of patients."

Resolutions adopted by the Section on Ophthalmology of the American Medical Association at the Chicago Session, in June 1924, but never presented to the House of Delegates and consequently never adopted by the House, were as follows:

> RESOLVED, That it is the sense of the Section on Ophthalmology of the American Medical Association that we deprecate the selling of glasses by the ophthalmologist to his patients in communities where the services of reliable dispensing opticians are obtainable; and
>
> RESOLVED, That the acceptance of commissions or considerations, either directly or indirectly, from opticians and optical houses from the sale of glasses is absolutely contrary to all our standards of medical ethics and is just as reprehensible as the splitting of fees.

It would seem that far fewer ophthalmologists merely give the patient the prescription for glasses and permit him to enter alone into negotiations with an optician, and themselves have nothing to do with the finances of the procurement of the glasses, than those who share in the financial transactions inherent in dispensing the glasses in some manner or other. If this supposition is correct, it means that most of the eye physicians so acting desire, or are forced, to participate in the financial transaction. The secrecy which they maintain in regard to the matter indicates at least a lack of approval of the practice.

It is understandable that in the numerous communities where there are no dispensing opticians the ophthalmologist must find some other agency to fill his prescription. Criticism has seldom been directed toward ophthalmologists who have dispensed their own optical goods and charged the patient for the glasses plus the physician's overhead if no dispensing optician was available. However, there are many who do not wish to enter into this mechanical and commercial phase of ophthalmology and seek for some other solution.

There are others who hesitate to ask the dispensing optician to make the numerous changes in lenses sometimes necessary before the patient is comfortable, without extra charge to the patient, yet themselves have no reserve account against which to charge the loss and would welcome some means of avoiding this situation. If it is granted, as is surely true, that most dispensing opticians do actually finance any changes that the referring ophthalmologist directs if made within a short period, is this not essentially a tacit business arrangement with the optician which he accepts in order to encourage patronage?

The question that the profession must decide is whether it is ethical for the ophthalmologist to enter into a purely business relationship with the patient in addition to his professional relationship. In its simplest terms this involves the furnishing of glasses at a price to the patient which will at least cover costs, breakage, mistakes, bad accounts, and so forth. It must undoubtedly be granted that this business will usually be conducted for a profit and may not be reflected to the patient in reduced cost to him, though undoubtedly it often will be. If it happens that the ophthalmologist does not have the time, the desire, or the mechanical bent to fit frames, mount lenses, and perform the many other duties of an optician, may he ethically employ a technician to do this and he himself conduct the financial transactions with the wholesale optician and the

patient as regards the glasses?

It has also been proposed that the eye physician may employ an agent to dispense the lenses at a price specified by the doctor and to collect the fees and turn over to the ophthalmologist any profit accruing from the transaction after deducting the agent's commission, overhead, costs, and so forth, or to charge any loss to the physician's account. The catch is that if the ophthalmologist specifies a price that seems too low to the agency his business will be refused. By too low is meant a price that is materially below the usual retail price in the community or any charge very close to the wholesale price, because such a charge would tend to reduce the general retail price. Manufacturers of optical goods are primarily concerned with the wholesale price in the setting of which they have the important voice and they will concern themselves very little about anything that will not affect this. But if anyone attempts to reduce this, let him beware!

Do these practices constitute rebating? Certainly the first two could not be so classed. They may, however, be associated with hidden profits for the physician, though this is not necessarily true.

There should not be a law, nor even a rule of ethics, in a democratic country that has not the approval of a majority and it is dangerous to have one that is violated by the majority. Can it be doubted that the present ruling as now generally interpreted is in that class?

It has proved demoralizing to the profession to have in effect a ruling that is so unpopular that it is not enforced and is essentially unenforceable. A definition of what exactly constitutes the rebating referred to in the Principles of Medical Ethics is needed. Some means of dispensing lenses that are available or can be made available to every ophthalmologist should be officially sanctioned by the medical profession. Nothing but increasing dissensions can come from the present uncertainty. Therefore, it behooves the leaders in ophthalmology to formulate regulations that will cover these cases.

Would it not be a sound idea for the Executive Committee of the Section on Ophthalmology of the American Medical Association to formulate a resolution defining exactly what practices in regard to dispensing of optical goods may be ethically entered into by the members of the Section? If the resolution is adopted by the section, it should then be presented to the House of Delegates for adoption and thereby become the current ruling for ophthalmologists in organized medicine. An interpretation sufficiently broad to cover the various needs in different communities and under diverse circumstances might well settle this continually distressing question.

The writer has no desire to see a coat of whitewash applied to black practices. But he does believe that to declare certain procedures unethical and let it go at that is not sufficient, but that the positive phase of the question should be considered and a definition of what *is* permitted be given.

The writer is not ingenuous enough to believe that anyone who has heretofore had a profit from the sale of glasses that has constituted an important part of his income is going to give it up for any ethical consideration whatever. But a definition of ethical practices might be useful to newcomers into the profession who desire to follow the precepts they have learned in their training. It would be very helpful in ultimately rooting out bad practices if every national society, and local too, would adopt these principles as requirements for membership and make a special point of the matter in regard to candidates for enrollment. The American Board of Ophthalmology for many years had all candidates sign

an agreement not to accept any form of rebate, but this was discontinued because it was not possible to follow up the matter. Now there is a statement on the attitude of the Board in the matter which the candidate must read. Continued stressing of ethics by the Board, even if they think a pledge undesirable, cannot fail to influence well-educated young ophthalmologists who are entering practice with high ideals and great respect for the opinion of the Board members. It is not thought that passing new directives would bring about Utopia. Nor is this a police measure. It would, however, substitute a guide for a prohibition.

Lawrence T. Post.

MEDICAL SPAIN IN MEXICO

The praise and reverence accorded to great men, although not commonly so analyzed, has in large part a utilitarian purpose and effect. Such may have been the original design of the founders of that ancestor worship which is so all-pervading a feature of Chinese life, although it must be admitted that an important role may have been played by primitive man's tendency to assume continuity of existence for that mysterious psychic unit which we call the soul.

Regard for the merits and achievements of human forebears has undoubtedly contributed much to the development of morality and ethics. Such influences are seen in family tradition and in the ideals and tendencies of politics and science. When we assemble, either in person or in the creation of literary monuments, to honor one who during life accomplished great things for our chosen profession, we gain by the stimulus to activity along similar lines.

The greatest scientific workers are conspicuous not merely for their individual labors but also as leaders, as centers of schools of thought, method, and investigation. Examples of such radiating influence are Newton the physicist, Harvey the physiologist, Koch and Pasteur the bacteriologists, and Galileo the astronomer.

A man who, during his long and very active life, and also after his death, was to be counted among the greatest not only in research but in leadership was born in 1852 in an obscure village of Spain. That country, often thought of chiefly in connection with tragic facts in her history, has produced many men distinguished in the arts of peace. Ramon y Cajal lived to receive the greatest honors bestowed upon scientists, including the Nobel prize. In life, and after death, he was revered by an earnest group of scientific workers of his own and other countries.

The ghastly civil war in which Spain pointed the way to the present world-wide conflagration had, among other disastrous consequences, the effect of driving into exile a number of those Spanish intellectuals who had espoused the democratic cause. Men formerly conspicuous in Spanish medical education are now to be found in several of the former colonies of Spain in the Western Hemisphere. One of these, Professor M. Márquez, long known among ophthalmologists as the founder of the Archivos de Oftalmologia Hispano-Americanos, is now practicing in Mexico City. A pupil and profound admirer of Ramon y Cajal, our distinguished colleague illustrates the fact that civil warfare has frequently benefited humanity by forcing into exile workers and thinkers who enriched the land of their adoption.

In Mexico City, a couple of years or so ago, Professor Márquez joined with other Spanish physicians "who now enjoy the hospitality of the Mexican people" in founding "El Ateneo Ramon y Cajal," a medical orgnization to which, says Márquez, the name was given with

"the idea . . . of placing our association under the egis of the greatest man of our race who has existed in the realm of biology . . ." On October 17, 1942, the new Ateneo joined with a distinguished and much older Mexican medical organization, the "Academia Nacional de Ciencias Antonio Alzate," in celebrating the eighth anniversary of the death of the famous neuro-anatomist. The Ateneo also created a new medical journal, "Anales de Medicina del Ateneo Ramon y Cajal," an impressive publication, of which four issues have so far appeared. The energetic editor of this publication, as might be supposed, is Professor Márquez.

The first issue of the Anales was devoted to the addresses delivered at the anniversary celebration just referred to, including a paper by Márquez on "Cajal, investigator and teacher," one by Julio Bejarano on "Cajal, the citizen," one by Martinez Baez on "Cajal, the biologist," and one by Tomás G. Perrin entitled "The voice of Cajal." (The Madrid "Center for Historic Studies" some years ago undertook the phonographic recording of the voices of distinguished persons, and a recording of Cajal's voice was reproduced at the meeting in Mexico City.)

Cajal, we are reminded by Márquez, "discovered a microscopic new world: that of the fine structure of the nervous system, fundamental basis for the knowledge of its normal and pathologic functioning." Of the central nervous system, Cruveilhier (quoted by Márquez) had said in 1871: "Of all the organs there is none whose study more excites our curiosity and unfortunately there is none whose texture is surrounded by denser shadows." It was left for Golgi and especially for Cajal to lift the veil.

A famous Italian psychiatrist wrote of Cajal "Without exaggeration . . . it may be said that modern neurology owes above all to Santiago Ramon y Cajal the enormous progress made in the past century." A German physician, writing on the occasion of Cajal's death in 1934, said: "To Ramon y Cajal has been granted a fate which only very exceptionally falls to the lot of a man of science: he wished to make the name of his country respected throughout the whole world. This aim he attained."

Because the optic nerve and retina, with the optic tracts and centers, are a part of the central nervous system, the work of Ramon y Cajal belongs as much to ophthalmology as to general neurology. The new Mexican medical publication established by Márquez and his colleagues is a fine monument to Spain's greatest medical scientist.

W. H. Crisp.

CORRESPONDENCE

Relation of anisometropia to aniseikonia

Editor,
American Journal of Ophthalmology:

In the May, 1943 issue of the American Journal of Ophthalmology we published an article entitled "A study of the aniseikonia in a case of increasing unilateral index myopia."

In this article we reported the measurements obtained between the years 1936 and 1942 in a case of anisometropia due to increasing lenticular myopia in the right eye. A close association between the anisometropia and the measured and computed aniseikonia was shown. We have had, since then, a chance to recheck this patient—in March, 1943, and in November, 1944. We thought that it might be of interest to you and your readers to have a short report on these follow-up examinations. Both in 1943 and in 1944 the patient returned complaining of recurrence of his symptoms of reading difficulties and of decreasing

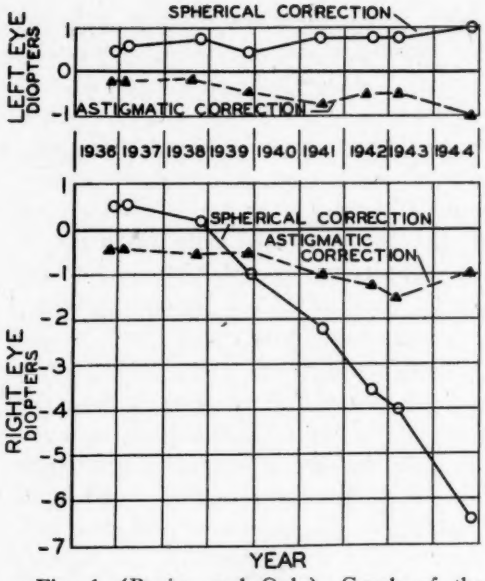

Fig. 1 (Burian and Ogle). Graph of the changes in the spherical and astigmatic refractive errors of a patient with increasing unilateral index myopia over a period of eight years.

vision in the right eye. Objectively an increased density of the right lenticular nucleus was found, without a marked increase in cortical opacities.

The spherical refractive error in the right eye had increased to −4.00D. in March, 1943, and to −6.50D. in November, 1944. The corrected visual acuity of the right eye on these dates was 20/40+3 and 20/60, respectively. The refraction of the left eye had remained essentially unchanged. The aniseikonia, when the patient was last measured, had increased to 13.5% over-all in accordance with the increase in anisometropia.

The enclosed two graphs represent the changes in refraction over the entire period from 1936 to 1944, and the corresponding changes in aniseikonia for the same period of time.

(Signed)
Hermann M. Burian, M.D.
Kenneth N. Ogle, Ph.D.

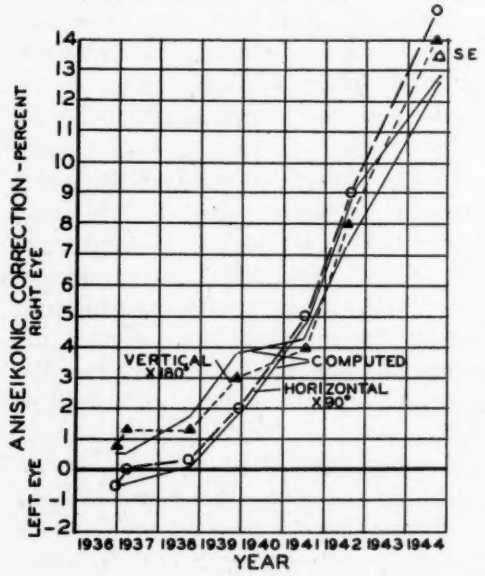

Fig. 2 (Burian and Ogle). Graph of the aniseikonia of the same patient, showing the marked increase that accompanied the progress of the anisometropia. The solid lines are the calculated figures.

Capillary hemangioma of the palpebral conjunctiva

December 26, 1945

Editor,
American Journal of Ophthalmology:

In the November, 1944, issue of this Journal there appeared a pathologic report entitled "Capillary hemangioma of palpebral conjunctiva" by Capt. Otis D. Wolfe.

Several points in this case do not support such a diagnosis. Although the described tumor was covered with epithelium, microscopic examination revealed thin-walled capillaries, young fibrous tissue, and inflammatory cell—all typical of an inflammatory granuloma. The patient was noted to have had five chalazia previously. One of the most common causes of a polypoid mass of granulation tissue upon the palpebral conjunctiva is the rupture of a chalazion through the conjunctiva. The tumor described by Captain Wolfe suggests a similar origin. Reference—Duke-Elder, W. S. Textbook of ophthalmology. St. Louis, C. V. Mosby Co., v. 2, p. 1787.

(Signed)
Frank C. Lutman, 1st Lieut.
O-535577 M.C.

ABSTRACT DEPARTMENT

EDITED BY DR. WILLIAM H. CRISP

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is mentioned only in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases and parasites
18. Hygiene, sociology, education, and history
19. Anatomy, embryology, and comparative ophthalmology

1

GENERAL METHODS OF DIAGNOSIS

Crawford, H. E. **Biomicroscopic surgery and treatment.** Arch. of Ophth., 1944, v. 32, Sept., pp. 215-216.

The author tells how he uses the biomicroscope in removal of foreign bodies of the cornea, treatment of ulcers, removal of sutures, and epilation of misplaced cilia. (2 references.)

R. W. Danielson.

Crisp, W. H. **Pitfalls of the general physician in ocular diagnosis.** Rocky Mountain Med. Jour., 1944, v. 41, Sept., pp. 626-633. (See Section 18, Hygiene, sociology, education, and history.)

Disler, N. N. **The unfrosted electric lamp in ocular practice.** Viestnik Oft., 1943, v. 22, pt. 4, p. 31.

Because of its greater intensity of illumination, Disler advocates the use of the unfrosted electric bulb for inspection of the eye, for oblique illumination, for indirect ophthalmoscopy, and for the hand slitlamp. An electric bulb with a filament of two or three coils is more suitable than one with a longer filament. To provide a brightly illuminated area similar to that obtained with the slitlamp, a diaphragm with a slit over the bulb was designed by Disler in 1935. Such illumination is easily arranged where a slitlamp is not available, as for instance in field hospitals, and is helpful in the diagnosis of the varied ocular injuries seen at the front. With this illumination one can see the details of the iris, the lens, and the anterior portion of the vitreous body. The bulb may also be used for diaphanoscopy in outlining the presence of foreign bodies in cornea, iris, and lens.

Ray K. Daily.

Ellis, O. H. **A new goniotomy lens.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1258-1265. (4 illustrations, fields, references.)

Feldman, J. B. **An absolute monochromatic ophthalmoscope.** Arch. of Ophth., 1944, v. 32, Sept., pp. 213-214.

The author gives a description of an ophthalmoscope designed by himself. With this instrument it is imperative

that unfiltered light be never used; otherwise retinal damage will result. The instrument is of value not only as an ophthalmoscope, but also to illuminate the lens in surgery. Some surgeons use only ultraviolet rays after operations for cataract, to determine whether all the lens matter has been removed. The author, however, has found monochromatic yellow of greater value in illuminating the field after extraction of a cataract. The monochromatic ophthalmoscope is of value in questionable fundus cases, by making pathologic conditions stand out more prominently. (One illustration.)

R. W. Danielson.

2

THERAPEUTICS AND OPERATIONS

Adamiuk, V. E. **Therapeutic transplantation of skin.** Viestnik Oft., 1943, v. 22, pt. 4, p. 12.

Adamiuk, to simplify the procedure introduced and popularized by Filatov, shortens the period of conservation of the transplanted skin from several days to several hours. For traumatic corneal opacities he transplants a small piece of skin under the upper outer part of the bulbar conjunctiva. Absorption of the implanted skin releases a number of biologic products which stimulate absorption of the corneal opacities. In cases in which the implant is absorbed rapidly a second implantation may be made. Whether the patient's own skin is just as effective as skin taken from another person and whether delayed absorption produced by rolling the transplant into a tube would be of advantage are problems to be solved in the future. Ray K. Daily.

Bellows, J. G. **Penicillin therapy in ocular infections.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1206-1218. (11 tables, references.)

Carreras, B. **How to prevent hemorrhagic complications in orbital anesthesia.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 419-424.

The occurrence of orbital hemorrhage is very annoying although infrequent. To prevent these hemorrhages it is proposed that a sharp needle be used only for injecting novocaine beneath the skin. The deep injection is then made with a needle whose point has been blunted on a stone.

J. Wesley McKinney.

Cordes, F. C. **Fever therapy in ophthalmology.** Jour. Amer. Med. Assoc., 1944, v. 124, Jan., pp. 14-23.

With a review of the literature, the author discusses the mechanism of the beneficial effect of foreign-protein therapy. He concludes that milk injections are of particular value in the treatment of infants; fever enhances the action of sulfonamides given concurrently. Although diphtheria antitoxin has many disadvantages, its use in sympathetic ophthalmia seems justified. Typhoid vaccine is the most widely useful agent, and small doses administered over a longer period of time seem as effective as larger, more shocking doses. Coley's mixed toxins are advisable when a milder fever is indicated or the use of typhoid vaccine is not warranted. Omnadin has some value in producing leucocytosis and a rise in the antibody content of the blood. The use of malaria is not justified for ophthalmic diseases. Hyperpyrexia induced by high-frequency methods is still in the experimental stage and further research is needed. Among physical means production of

fever is best obtained by air-conditioned cabinets of the Kettering type. It is most efficacious in gonorrheal and syphilitic diseases of the eye. (Discussion, bibliography.)

Robert N. Shaffer.

Crawford, T., and King, E. F. **The value of penicillin in the treatment of superficial infections of the eyes and lid margins.** Brit. Jour. Ophth., 1944, v. 28, Aug., pp. 373-383.

Penicillin used locally as a solution (250 units of c.c.) or as an ointment (250 units per gm. of 30-percent lanette wax in water) was found to excel any therapeutic agent hitherto employed in the treatment of superficial infections of the conjunctiva, cornea, and lid margins. It also proved effective in stubborn cases which were resistant to other forms of treatment, sterile cultures being obtained within a few days after treatment was started. No case due to a penicillin-resistant organism was found. The four cases which showed recurrence after cessation of treatment were all due to organisms as sensitive to penicillin as those causing the original infection.

Penicillin proved just as effective in clearing up cases of conjunctivitis associated with skin lesions (seborrheic dermatitis, acne rosacea) as in uncomplicated cases. (6 tables, references.)

Edna M. Reynolds.

Knapp, F. N. **Treatment of ocular tuberculosis.** Arch. of Ophth., 1944, v. 32, Sept., pp. 196-203.

After a review of the literature and reports of several cases, the author gives the following personal opinions as to the treatment of ocular tuberculosis: Rest in bed in a sanatorium or at home is urged. A high vitamin and high caloric diet is advisable. Radium treatment is at times advisable, the beta rays for the cornea and the gamma rays for the more deep-seated lesions. Roentgen rays may also be utilized, although in general this therapy is only moderately effective and is usually limited to rather small and repeated doses. For chronic inflammatory lesions of the eye, the dose should be larger than for acute conditions, but it should never be so large as to endanger the structures of the most sensitive ocular parts, namely, the conjunctiva and the crystalline lens. Gold sodium thiosulfate is of value in some cases, although unfortunate local and general reactions have occurred. The author at times uses typhoid H antigen as advocated by Brown.

Mantoux diagnostic tests may be carried out by use of Seiber's purified protein derivative or old tuberculin. In the treatment of patients with ocular tuberculosis the aim is to cure by general treatment of the entire process in the organism, and not by treatment only of the local disease. Two main clinical groups of ocular tuberculosis stand in therapeutic opposition: on the one hand, malignant, exudative forms with the subjects toxin-sensitive, calling for conservative, general, and local treatment; on the other hand, benign, productive, or fibrous forms, with the subjects less toxin-sensitive, indicating a more aggressive therapy. (References, 2 illustrations, 1 in color.)

R. W. Danielson.

Mathewson, W. R. **Vitamin P in ophthalmology.** Brit. Jour. Ophth., 1944, v. 28, July, pp. 336-346.

Two cases of ocular hemorrhage are reported in which vitamin P was used with satisfactory results. The first case was that of a patient with multiple myelomata accompanied by subarach-

noid hemorrhage, retinal venous thrombosis, and retinal hemorrhages. Nasal and bladder hemorrhages were also present. When vitamin P was given, the bladder and nasal hemorrhages ceased. No new retinal hemorrhages occurred, and those already present were absorbed. During temporary suspension of vitamin P, nasal hemorrhages recurred, but they ceased when administration of vitamin P was resumed. The patient had had X-ray therapy for the myelomata, so the question arises whether the increased capillary permeability was due to the disease itself or to the X-ray therapy. It is suggested that in myelomata and other conditions vitamin P may be used to lessen the danger of hemorrhage after X-ray treatment.

The second case reported was one of recurrent hemorrhages into the anterior chamber after cataract extraction. With the use of vitamin P the blood rapidly disappeared from the anterior chamber and the patient's general condition improved markedly. It is suggested that vitamin-P deficiency, as well as vitamin-C deficiency, may be a factor in the causation of cataract. (3 charts.) Edna M. Reynolds.

Moreu, Angel. **A new model table for ocular operations.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 489-493.

The author's description is accompanied by photographs.

Oliveres, A. **Preservation of zinc sulphate collyrium.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 449-451.

Preparations of zinc sulphate soon show a precipitation due to action of the air, of the alkaline glass, and of contamination by organic material. Experiments were made with several preservatives and salicylic acid in 1 to 2000 strength was found to be the best. By adding this drug a clear stable solution was obtained, whose therapeutic effect remained unaltered indefinitely.

J. Wesley McKinney.

Riser, R. O. **Modern trends in ocular therapeutics.** Arch. of Ophth., 1944, v. 32, July, pp. 70-75.

This material taken from recent literature gives an excellent list of powders, creams, pastes, refrigerating pastes, and ointments, intended for use on the eyelids. The therapeutic agents used systemically and locally in glaucoma are well classified and presented. A review of the indications for use of the sulfonamides includes reprinting of the excellent table presented by Thygeson. Under the heading of "better eye drops," Riser discusses tonicity, hydrogen-ion concentration, buffer solutions, preservatives, substitutes for tears, surface tension, and wetting agents.

A tabulation is given of the recommended hydrogen-ion concentrations in terms of the p_H of various forms of buffered eye-drops. One may buffer one's own solutions, or one may specify Gifford's buffer solution or Feldman's buffer solution to the druggist. (References.)

R. W. Danielson.

Selfa, Enrique. **The local use of the sulfonamides in some ocular affections.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, Nov.-Dec., v. 3, pp. 442-448.

Local application of the sulfonamides brings a high concentration to the tissues, and in external ocular affections it may be superior to use of the drug by mouth. Eight cases of acute conjunctivitis, three with pseudomembrane and

five without pseudomembrane, were observed. All responded rapidly to the use of sulfathiazole ointment locally. Of 12 cases of phlyctenular disease all but one responded well to sulfathiazole ointment. The response was much more rapid than that previously obtained with yellow oxide of mercury and calomel. Local application was very effective in inclusion blennorrhea and in gonorrheal ophthalmia of the newborn, and it is suggested that local application of sulfathiazole ointment might be more efficacious than silver nitrate in prophylaxis. In Koch-Weeks infection also sulfathiazole was effective, but in Morax-Axenfeld conjunctivitis no benefit was obtained.

J. Wesley McKinney.

Swan, K. C. **Reactivity of the ocular tissues to wetting agents.** Amer. Jour. Ophth., 1944, v. 27, Oct., pp. 1118-1122. (3 figures, references.)

Von Sallman, L. (with technical assistance of J. Di Grandi). **Simultaneous local application of penicillin and sulfacetimide.** Arch. of Ophth., 1944, v. 32, Sept., pp. 190-192.

This paper deals with (1) preliminary experiments to determine compatibility of penicillin and sulfonamides in vitro, (2) iontophoretic application to rabbit eyes of a solution containing penicillin and a sulfonamide compound, and (3) the comparative effect of three types of therapy on a staphylococcic endophthalmitis produced in chinchilla rabbits.

It was found that sulfadiazine and sulfacetimide did not exert noticeable antagonistic effect on the bacteriostatic activity of penicillin in vitro. A single injection of 0.2 c.c. of a 10-percent solution of sodium sulfacetimide led to high concentration in the vitreous and a lower in the aqueous, the level in the vitreous being close to 15 mg. per 100 c.c. 72 hours after injection.

Damage attributable to penicillin was limited in general to a slight inflammatory reaction without integral lesions of retina, lens, or vitreous. Repeated intravitreal injection occasionally caused permanent lesions of retina or lens. The irritation following injection of sulfacetimide was usually greater than following penicillin.

A reliable standard infection of the vitreous leading to phthisis bulbi was produced by intravitreal injection of 0.05 c.c. of a broth culture of Staph. aureus in a dilution of 10^{-4}. This infection was checked in all instances by penicillin if injected into the vitreous six or twelve hours after the inoculation; but the treatment was only of slight benefit when initiated 24 hours after inoculation. The infection was not influenced by intravitreal injection of sodium sulfacetimide six hours after the inoculation. (4 tables, 3 figures, references.) R. W. Danielson.

Von Sallman, L., Meyer, K., and Di Grandi, J. **Experimental study on penicillin treatment of ectogenous infection of vitreous.** Arch. of Ophth., 1944, v. 32, Sept., pp. 179-189. (See Section 10, Retina and vitreous.)

3

PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Enos, M. V. **Suppression versus amblyopia.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1266-1271. (One table.)

Kekcheyev, K. **Problem of night vision.** Amer. Review of Soviet Med., 1944, v. 1, April, p. 300. (See Amer. Jour. Ophth., 1943, v. 26, Nov., p. 1236.)

Lancaster, W. B. **Present status of eye exercises for improvement of visual function.** Arch. of Ophth., 1944, v. 32, Sept., pp. 167-172; also Trans. Amer. Acad. Ophth. and Otolaryng., 1944, 48th mtg., p. 413.

Lancaster stresses the thesis that seeing is only one half ocular, the other half cerebral. There is abundant evidence for the general proposition that exercises, repetition, practice, and learning lead to better performance, to the acquisition of skill. Repetition and practice build up a substratum of memories useful for interpretation of sensations and facilitate the syntheses which are the major part of seeing. Motor functions are perfected by practice, and reflex pathways are facilitated. Ophthalmologists have concentrated their attention on the primary source of the sensation.

Lancaster is skeptical of actual structural changes being wrought by exercises, apart from the hyperplasia and hypertrophy of muscles and the consequent changes induced in tendons and perhaps in bones. Some clearing of corneal opacities often occurs, but not by means of exercises. It is doubtful that any changes in size or shape of the eyeball are brought about by such means. The burden of proof is on those who make such claims. (References.) R. W. Danielson.

McEachern, D., Layton, B. D. B., and Burr, E. G. **Canadian Army night-vision training and testing unit.** War Med., 1944, v. 5, May, pp. 283-291.

The Canadian Army has developed a night-vision training and testing assembly, the operation of which is described. A preliminary group-training session uses landscape silhouettes projected at low brightness. The men are then tested individually. By the test procedure men can be divided into four groups as regards night visual-acuity. The test-retest reliability appears to be satisfactory. The initial test will place a soldier in his proper category or on occasion in a category just below it. In no case has the initial test been shown to overrate the night visual acuity. Some units are mobile and equipped with portable dark room. Specially prepared silhouettes are used for the training of men on specific schemes or objectives. This form of training bears the same relationship to night field schemes as the sand table does to daytime maneuvers. (4 figures, 3 tables.) M. Lombardo.

Mayer, L. L. **Effect of diethylstilbesterol on accommodation.** Arch. of Ophth., 1944, v. 32, Aug., pp. 133-134.

The author has noted a number of women with weakened accommodation, apparently the result of the administration of diethylstilbesterol. Five illustrative cases are reported. In most instances the androgen was administered for the relief of menopausal symptoms in patients presenting some degree of presbyopia. In these patients, a stronger reading addition was required than normal for their age. One of the patients was a 16-year-old girl whose near point had receded to 38 cm. In her, as in some of the older women, accommodative power returned to normal after administration of the drug was stopped. The use of diethylstilbesterol is known to be attended by some undesirable reactions, including, in order of frequency, nausea, vomiting, headache, vertigo, abdominal distress, diarrhea, and dermatoses. This article presents the first record of any ocular complication from the use of the drug. (References.) John C. Long.

Pascal, J. I. **Intrinsic variability of astigmatic errors.** Arch. of Ophth., 1944, v. 32, Aug., pp. 123-124.

The variable factor occurs in the astigmatic correction at the plane of the correcting lens. When properly corrected for distance, the astigmatic eye develops a new astigmatic error when accommodating for near. The amount of this astigmatism varies with the amount and kind of true astigmatism, with the position of the correcting lens, with the nearness of the object viewed, and according to whether the amount of accommodation used is related to the meridian of greatest power or the meridian of least power. The amount of this induced astigmatism is ordinarily slight but may amount to 0.5 D.

Variability in axis of astigmatism may be due to any or all of the following factors: (1) cyclophoria: when the axis is determined with one eye occluded, thereby producing dissociation, the finding will be off axis to the extent of the imbalance; (2) the compensatory rotation of the eye when the head is tilted toward either shoulder; (3) the binocular extorsion when the eyes change from distant to near vision. The extent of change in axis may possibly amount to 5 or 10 degrees.

In general, these variations in astigmatism do not cause any special distress except in hypersensitive eyes. Should the determination of axis be somewhat variable when tested at 20 feet, it would be better to select the more temporal position for the correction, in line with the physiologic extorsion. As near vision is generally more important, one might obtain a correction compromise by determining the astigmatic correction at some intermediate point, such as 40 or 50 cm. It should be possible to avoid the error induced by cyclophoria, by locating the astigmatic axis during binocular fixation. John C. Long.

Pérez Llorca, J., and Jiménez Almenara, J. **Changes in the index of refraction of the ocular media in animals given sulfonamides.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 425-431.

To determine whether a change in index of refraction might be the cause of the reported cases of myopia occurring in the course of sulfonamide therapy, the authors carried out several experiments on ox eyes in vitro. Increasing amounts of albucid and neopental were injected into the anterior chamber. No appreciable increase in index of refraction was noted. The cornea, lens, and vitreous were submerged in various concentrations of the same drugs for 24 hours, but again no appreciable increase in the index of refraction was noted.

J. Wesley McKinney.

Prado Durval. **Let us rationalize our optometric scales.** Arquivos Brasileiros de Oft., 1944, v. 7, June, pp. 89-94.

The author is impressed by certain inconveniences in the use of letters for these scales, such inconveniences being related especially to the variable recognizability of the letters, to the facility with which they are memorized, and to the impossibility of their use with illiterates. The relative merits of the Landolt broken circle, the illiterate "E" of Snellen, and the open square of de Wecker are discussed. Prado also argues in favor of a test card graduated in 15 steps from 0.1 to 2.00 (0.1, 0.15, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.25, 1.50, 1.75, 2), because a number of individuals have acuity a good deal above Snellen's so-called normal or unity.

The Snellen illiterate "E" is particularly favored, and a new scale has been printed by a firm in the author's home town, São Paulo, Brazil. (2 figures, references.) W. H. Crisp.

Sergievsky, L. I. **Shortening the period of atropine cycloplegia by means of weak solutions of eserine.** Viestnik Oft., 1943, v. 22, pt. 3, p. 35.

With the above objective 0.25 percent eserine was used on 76 patients, and 0.5 percent on 27, the age of the patients varying from six to forty years. These patients had received instillations of 1 percent atropine for ten days, for refraction. During the first day the instillations of eserine were made five or six times; during the following days, as needed; the need being determined by inability to accommodate, and not by the size of the pupil.

The data show that it is possible to restore the function of the internal ocular musculature of the normal uninflamed atropinized eye in one day by instillations of weak solutions of eserine. In some cases final abolition of cycloplegia may be delayed six or seven days. The criterion of restored function was ability to read for eight hours, or the working day. Patients able to read for eight hours are considered able to work, even if at the end of the eight hours the action of eserine ceases. The effect of eserine on the atropinized ocular musculature increases with the number of instillations, setting in more rapidly and holding longer. It is suggested that in first-aid stations of industries and schools the failing effect of eserine may be restored by a single instillation. Ability to read for eight hours was attained within three days by instillation of 0.25 percent eserine; thus after three days use of this drug workers and children may be returned to industry and school, respectively, provided they are supplied with eserine for use as needed. The effect of eserine varies in different people, and in the same person it may affect the pupil and accommodation differently. There was no significant difference in the effect of 0.25 percent and 0.5 eserine on the cycloplegia, but the disagreeable sensations caused by eserine are more frequent with the use of the stronger solution.

Ray K. Daily.

Sloane, A. E. **Refraction clinic.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1287-1289.

4

OCULAR MOVEMENTS

Burian, H. M. **Motility clinic. Concomitant convergent strabismus with overaction of the inferior oblique muscles and dissociated vertical divergence.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1284-1287. (3 figures.)

Crowe, M. P. **Familial spastic paresis with strabismus.** Arch. Dis. in Childhood, 1944, v. 19, March, p. 32.

The presence of different degrees of weakness of spasticity, and of adduction deformity of the lower limbs in the five children of a family is described. Signs of an upper-motor-neuron lesion are present in all five. This condition, first noticed in infancy and presumably present antenatally, resembles the clinical entity described as Little's disease, with, in addition, the presence of ocular manifestations.

The occurrence of the five cases in one family would seem to exclude an infective or traumatic etiology, and the origin probably is, as described by

Collier, "a primary neuronic degeneration due to factors which are at present entirely elusive." Different degrees of hypermetropia, accompanied by loss of vision, exist in each child, and strabismus is present in four. Visual acuity is about 6/12 in each case.

An obscure common deprivation process may exist. Since neither the parents nor the grandparents have similar defects, any genetic factor responsible would seem necessarily to be of the recessive rather than the dominant type. But the parents are not related. Theodore M. Shapira.

Da Luz, Barbosa. **More concerning strabismus.** Rev. Brasileira de Oft., 1944, v. 3, Sept., pp. 13-22.

A brief review in somewhat general terms, with several quotations from the literature of strabismus, is accompanied by the statement that orthoptic training is valuable not merely in strabismus but in some cases of asthenopia without error of refraction but with poor binocular fusion. (References.)

W. H. Crisp.

Enos, M. V. **Suppression versus amblyopia.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1266-1271. (One table.)

Faulkner, S. H., Scully, E., and Carter, E. E. **Operations on one hundred cases of convergent concomitant squint.** Brit. Jour. Ophth., 1944, v. 28, Aug., pp. 403-407.

To show the degree of success which can be obtained by operation combined with orthoptic treatment, 100 consecutive cases among children from six to 14 years of age at the Salford Municipal Hospital are reported. Forty-five of the cases showed satisfactory binocular vision at the angle of squint.

The first operations carried out were: advancement and recession 48, bilateral recession 32, bilateral advancement 6, single advancement 8, single recession 4, single recession and myectomy of inferior oblique 1, myectomy of inferior oblique 1.

In 92 of the cases the eyes were rendered approximately straight by operation and orthoptics. One patient considered to be a case of psychologic squint was unimproved by a second operation. The other seven relatively unsatisfactory cases would probably have responded to further operation.

Edna M. Reynolds.

Hughes, W. L. **Recession of the trochlea for reducing the action of the superior oblique muscle.** Amer. Jour. Ophth., 1944, v. 27, Oct., pp. 1123-1131; also Trans. Amer. Ophth. Soc., 1943, v. 41, p. 307. (10 figures, references.)

Krewson, W. E., 3. **Comparison of the oblique extraocular muscles.** Arch. of Ophth., 1944, v. 32, Sept., pp. 204-207.

This article compares and contrasts the anatomy and physiology of the two oblique extraocular muscles. The superior oblique is the longest muscle in the orbit, the inferior oblique the shortest. The superior oblique has the longest tendon of all the extraocular muscles but no check ligament, while the inferior oblique muscle has no tendon but the longest check ligament. The superior oblique muscle has the most variable insertion, the line being usually on the vertical meridian, anterior to the vortex veins; the inferior oblique muscle has the most constant insertion, being located on the horizontal meridian and posterior to the vortex veins. The superior oblique muscle has a contralateral innervation, while the inferior oblique muscle has an ipsilateral

or a bilateral representation. The superior oblique muscle acts as a depressor, the inferior oblique as an elevator; their respective actions increasing as the eye turns inward and decreasing as the eye turns outward. The former acts as an intorter, the latter as an extorter; both torsional actions increasing as the eye is turned outward and decreasing as it is turned inward.

Both muscles are reputed to act as external rotators, the action increasing as the eye turns outward and decreasing as the eye turns inward. In the case of the inferior oblique, however, there may be some question whether it acts as an internal or an external rotator. The superior oblique is the second most frequently paralyzed muscle; the inferior oblique the least frequently involved, the lesion being then often accompanied by internal ophthalmoplegia. Vertical diplopia is greater with paralysis of the inferior oblique than with paralysis of the superior oblique. The false image pointing to paralysis of the superior oblique leans to the normal (opposite) side, and that related to the inferior oblique leans to the affected (same) side. (References.)

R. W. Danielson.

McCaslin, M. F. **The orthoptic treatment of the phorias.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1272-1273.

Paiva, Clovis. **Congenital paralysis of the external rectus; Duane's syndrome.** Rev. Brasileira de Oft., 1944, v. 3, Sept., pp. 25-29.

Under this ambitious title the author discusses the case of a 14-year-old girl who showed an apparent congenital paralysis of the right external rectus, with slight narrowing of the right palpebral aperture. There was also a facial asymmetry, the right orbit being definitely more posterior than the left. (3 photographs.)

W. H. Crisp.

Posner, Adolph. **Divergence excess considered as an anomaly of the postural tonus of the muscular apparatus.** Amer. Jour. Ophth., 1944, v. 27, Oct., pp. 1136-1142. (References.)

Posner, Adolph. **Noncomitant hyperphorias.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1275-1279. (References.)

Shure, I. I. **Strabismus in adults.** Arch. of Ophth., 1944, v. 32, Aug., pp. 113-119.

This is an analysis of results in 65 cases of strabismus in adult males, all of whom underwent operative procedures and received orthoptic treatment. Each case was refracted under cycloplegia, the amount of deviation measured, the near point of convergence determined, the degree of fusion measured, and the presence or absence of anomalous retinal correspondence noted. The surgical procedure consisted of recession of one muscle often combined with resection and advancement of the opposite muscle. No patient in the entire series was dismissed until a thorough attempt had been made to develop fusion. Each patient was given orthoptic training with the stereoscope on removal of the bandages, usually about 48 hours after operation. Treatment consisted of two sessions of 15 minutes each day for one week, after which the periods were increased to thirty minutes. Some degree of fusion was obtained in approximately 60 percent of the cases. Amblyopia, suppression, poor fixation, and anomalous retinal correspondence were found to constitute definite obstacles

in the treatment. Transient diplopia was present in 75 percent of the cases immediately after operation. In only one case was the diplopia persistently annoying. (4 figures, references.)

John C. Long.

Thorne, F. H. **Simple equipment for determining ocular-muscle efficiency.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1283-1284. (One figure.)

5

CONJUNCTIVA

Benedict, W. L., and Iverson, H. A. **Chronic keratoconjunctivitis associated with Nocardia.** Arch. of Ophth., 1944, v. 32, Aug., pp. 89-92.

Nocardia, a subdivision of the genus Actinomyces, has rarely been reported as a cause of ocular disease. A few cases of infection due to Streptothrix (a synonym for Actinomyces) have been recorded. The authors report an extremely chronic ocular infection associated with Nocardia in a Saskatchewan woman 23 years old. The disease in the eyes began at the age of seven years. There were episodes of ocular pain, lacrimation, photophobia, dimness of vision, and injection of the conjunctiva lasting from one to several weeks.

Examination revealed visual acuity of 3/60 in the right eye and 6/10 in the left. A few cilia were directed inward, and a grayish-white discharge was present. The inner surfaces of the eyelids presented either large patches of bright red granulation tissue or patches of scar. Posterior symblepharon was present. The right cornea showed finely granular infiltration throughout, as well as gross and microscopic vascularization of all parts of the cornea. During the four years that the patient has been under observation, the condition has remained nearly stationary. Treatment with sulfanilamide, potassium iodide, zinc sulphate, and metaphen, and local application of the sodium salt of penicillin, have all failed to show any noticeable effect.

Eight cultures made during the four years have all shown an organism that should be classified as one of the Nocardias. This organism grows readily on all of the common laboratory media. It is a Gram-positive pleomorphic rod, which produces a typical mycelium under some growth conditions. The cultural characteristics are described in considerable detail. Inoculation in the rabbit, guinea-pig and mouse failed to produce a disease process. Corneal and conjunctival injections in the rabbit caused no morbidity. (2 figures, references)

John C. Long.

Berens, Conrad. **Ophthalmia neonatorum.** Amer. Jour. Obstet. and Gyn., 1944, v. 47, June, p. 855.

In the school year 1906 to 1907, 28.2 percent of the pupils admitted to schools and classes for the blind were blind because of ophthalmia neonatorum. In the school year 1941 to 1942 the percentage was 5.6. These figures emphasize the great importance of the use of silver nitrate in the prevention of ophthalmia neonatorum and the value of the campaign waged by the National Society for the Prevention of Blindness for use of this preventive measure. Recent studies seem to indicate that silver is still the best preventive.

While silver nitrate is readily soluble in water, its solutions may gradually become concentrated by evaporation. Silver acetate crystallizes out as soon as a concentration of 1.2 percent is reached. Thus the danger of using a too concentrated solution is entirely

precluded in the case of silver acetate.

For the sulfonamide-resistant group, penicillin seems to offer great hope. If neither sulfonamide nor penicillin proves effective, artificial-fever therapy should be considered.

Theodore M. Shapira.

Bland, J. O. W. **Spontaneous folliculosis of the conjunctiva in grivet and vervet monkeys ... and the susceptibility of the grivet to trachoma virus.** Jour. Path. and Bact., 1944, v. 56, April, p. 161.

In grivet and vervet monkeys folliculosis of the lids develops spontaneously and can be distinguished neither clinically nor histologically from trachoma, to which these animals are susceptible. This condition makes the grivets and vervets unsuitable for trachoma research. To infection with trachoma, grivets respond by production of follicles in the fornices of the upper lids. Inclusion bodies, however, are never found. That the follicles are trachomatous is proved by the fact that the virus remains virulent for man even after four passages, producing clinical trachoma and the presence of inclusion bodies in smears.

R. Grunfeld.

Díaz-Dominguez, D., and Arqués, E. **Biomicroscopy of the corneal epithelium in conjunctival affections.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 452-457. (See Section 6, Cornea and sclera.)

Ferrer, Hector. **Results obtained in the treatment of trachoma with albucid.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 432-437.

Seventeen cases are presented to demonstrate the various types and stages of trachoma. The results obtained are grouped. Large doses of albucid (4 to 5 grams daily) were given for eight days. The subjective symptoms and corneal lesions were greatly benefited. In recent cases the conjunctival lesions were equally benefited, and the sulfonamides prepared the conjunctiva for the action of caustics and notably shortened the treatment.

J. Wesley McKinney.

Forstér, W. G., and McGibony, J. R. **Trachoma.** Amer. Jour. Ophth., 1944, v. 27, Oct., pp. 1107-1117. (4 tables, bibliography.)

Galpine, J. F., and Campbell, D. R. **Unilateral membranous conjunctivitis, with complete cast.** Brit. Jour. Ophth., 1944, v. 28, Aug., pp. 412-414.

The patient, a girl aged six years, was hospitalized for a moderate attack of scarlet fever. After being given 3,000 units of antistreptococcic serum intramuscularly, angina and rash disappeared and a routine nose and throat culture was reported negative. Ten days later an inflammatory condition of the left eye developed, with a great deal of discharge suggestive of gonococcic ophthalmia. The lids showed a membrane, and although a culture from the eye was negative for diphtheria and positive for hemolytic streptococcus, 8,000 units of antidiphtheric serum was given as a precautionary measure. The good eye was protected with a Buller's shield. The child developed a vaginal discharge. Smears showed a large number of pus cells with organisms resembling gonococci. On culture, only staphylococcus albus grew. A second culture from the eye showed the presence of streptococci only.

A week later the membrane was so extensive that it almost hid the cornea, which had become cloudy in the lower half. The membrane was like chamois

leather and extended from the limbus as a complete lining of the conjunctival sac. At no time was the pre-auricular gland enlarged. The cornea looked as though it could not possibly survive, and 60,000 units of antidiphtheric serum was given. Two weeks after the membrane was first seen, it began to separate from the margin of the lower lid. This continued slowly, and three weeks after separation began the membrane came away as a complete cast.

Later there was recurrence of the vulvovaginitis, smears from which showed organisms indistinguishable from gonococci. The latter organisms, however, were never obtained in cultures. At the end of her stay in the hospital the child developed a high fever which persisted for twenty days. Sulfonamides were given intensively by mouth, in addition to local treatment of the eye. Examination after an interval of three months showed vision of 6/24 in the left eye, with a large degree of irregular corneal astigmatism. There was a slight opacity in the lower half of the cornea, with extensive vascularization. Edna M. Reynolds.

Pokrovsky, A. I. **Pure hyperplasia, inflammatory hyperplasia, and an evaluation of trachoma.** Viestnik Oft., 1943, v. 22, pt. 3, p. 39.

Pokrovsky takes the position that trachoma is an inflammatory hyperplastic process, and not a pure hyperplasia, basing his opinion on the pathologic picture, the clinical symptoms, and epidemiology. After study of a large pathologic material of pure hyperplasia, as exemplified by leukomas, and of inflammatory hyperplasia as exemplified by tuberculous lymphogranulomatosis, he concludes that morphologically the changes in trachoma belong to the inflammatory type. One of the characteristics of lymphoid tissue is its response to irritation by a lively multiplication of cells, a property common to young tissue; the conjunctiva responds to irritation in the same manner. The inflammatory hyperplasia is most apparent in follicles, which represent very young tissue; in addition to this hyperplasia there are present in the follicles and adjacent tissue also other inflammatory phenomena. The low vitality and the rapid destruction of the lymphoid tissue in trachoma follicles correspond to the process in tuberculous lymphadenitis and inflammatory lymphogranulomatosis. Ray K. Daily.

Quiroga, M. I., and Mendía, J. A. **Syphilitic chancre of the palpebral conjunctiva.** Rev. Oto-Neuro-Oft., 1944, v. 19, May-June, pp. 81-83.

This region is one of the rarest locations for syphilitic chancre, which occurs here in less than two percent of all extragenital chancres. The mode of infection may be direct, as in kissing, removing foreign bodies with the tongue, spitting, and accidentally in perverted sex relationship; or indirect from infected objects such as towels and linens. With the chancre there is usually a pre-auricular or submaxillary adenopathy. The case of typical syphilitic chancre of the right lower palpebral conjunctiva here recorded was associated with neighboring adenopathy. Both the chancre and the lymphatic involvement cleared under arsenic and bismuth.

Edward Saskin.

Rosen, Emanuel. **Nevus flammeus associated with conjunctival telangiectasia and possible early choroidal tumor.** Amer. Jour. Ophth., 1944, v. 27, Oct., pp. 1143-1145. (4 figures.)

Rötth, Andrew de. **On the morbidity of trachoma.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1279-1282. (References.)

Selfa, Enrique. **Treatment of trachoma.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 438-441.

After a brief review of the local and general use of the sulfonamides in trachoma, various well-known local measures are discussed.

J. Wesley McKinney.

Verma, O. P. **Note on the treatment of angular conjunctivitis with riboflavin.** Indian Med. Gaz., 1944, June, p. 258.

In smears from cases of angular conjunctivitis associated with signs of riboflavin deficiency, Morax-Axenfeld bacilli were found in abundance. After intramuscular injection of 3 mg. of riboflavin for three days the bacilli disappeared and the smears became negative. Among the twenty cases of angular conjunctivitis so treated, two had superficial keratitis, 14 angular stomatitis with sore and fissured tongue, and three an eczematous condition of the skin. R. Grunfeld.

Wolfe, O. D. **Capillary hemangioma of palpebral conjunctiva.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp. 1289-1291. (Four illustrations.)

6

CORNEA AND SCLERA

Aparisa, Tomas. **Contribution to the treatment of leprous sclerokeratitis.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 461-463.

Ocular leprosy is most frequently localized in the cornea and sclera. For some reason the conjunctiva is rarely involved. Unfortunately treatment often fails to prevent involvement of the entire anterior segment of the globe in a repulsive leprous change. The treatment used at the Fontilles Sanatorium consists in sodium salicylate by mouth, calcium and neosalvarsan intravenously, fever therapy, and atropine and chaulmoogra oil locally. In some cases the corneal lesion is thoroughly curetted and covered with a conjunctival flap. J. Wesley McKinney.

Ayoub, J. E. M. **Desiccation keratitis.** Brit. Jour. Ophth., 1944, v. 28, July, pp. 347-355.

Twenty-five cases of desiccation keratitis occurring among troops fighting in the desert during the summer of 1942 are reported. The symptoms include abrupt onset of itching and smarting, with profuse lacrimation, marked photophobia, and definite visual disturbance. The objective findings are constant—episcleral injection with superficial corneal changes and irregular astigmatism.

The uniocular cases responded well to treatment by bandaging, but the bilateral cases did equally well with instillation of castor or cod-liver oil. Full mydriasis relieved the discomfort and hastened healing. In all except one case the cornea was healed and clear and the visual acuity restored to normal within from five to seven days. The etiology is probably drying of the cornea in cases of great fatigue, where the blinking reflex is reduced in frequency. (5 figures, 1 chart of clinical details.)

Edna M. Reynolds.

Brown, A. L., and Nantz, F. A. **Corneal healing: adhesive power of aqueous fibrin in the rabbit.** Amer. Jour. Ophth., 1944, v. 27, Nov., pp.

1220-1224. (One figure, 2 tables, references.)

Díaz-Dominguez, D., and Arqués, E. **Biomicroscopy of the corneal epithelium in conjunctival affections.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 452-457.

The authors report seven cases of the epithelial keratitis of Fuchs, characterized by irritation, lacrimation, photophobia, and haziness of vision. With slight injection of the bulbar conjunctiva, there were in the cornea many fine subepithelial infiltrates, more numerous at the center. The condition involved both eyes and cleared up in a few days. The causative agent is considered to be a virus. A review of the literature shows that similar superficial punctate infiltrates are encountered in epidemic keratoconjunctivitis, and often in acute conjunctivitis.

J. Wesley McKinney.

Grüter, Wilhelm. **Herpetic ocular diseases in the light of modern investigations of the virus.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 494-496.

Grüter's investigations have shown that herpetic lesions of various parts of the body are caused by the same virus as is found in many corneal lesions. Inclusion bodies indicating the presence of the virus have been demonstrated in the corneal corpuscles and epithelium, and within the neurilemma sheaths of the nerves, without involving the axis cylinders. The increased cellular metabolism produces gas which causes separations of the corneal lamellae, epithelial vesicles and bullae, folds in Descemet's membrane, and lesions of the endothelium. There is a migration of monocytes into the cornea. If necrosis ensues, lymphocytes and polynuclear cells appear. Many of these herpetic lesions are reversible. Thirteen herpetic ocular lesions are listed, including small ulcers of the lid margins, and keratitis vesiculosa, bullosa, dendritica, geografica, stellata, filiformis, striata, disciformis, parenchymatosa diffusa, endothelialis herpetica, and epidemica, as well as recurrent erosion of the cornea and herpes iridis. The treatment recommended is application of iodine to the superficial lesions and short-wave therapy to the deep lesions, the latter being based on the thermolability of the herpes virus. J. Wesley McKinney.

Jacoby, M. W., and Dominguez, R. **White rings of the cornea.** Arch. of Ophth., 1944, v. 32, Aug., pp. 97-100.

Only a small number of cases have been reported of the characteristic opacity of the cornea first described by Coats. Two theories have been advanced as to their causation. Ballantyne conjectures that the white rings result from degenerative changes, calcareous or otherwise, in drusen of Bowman's membrane. Kuan states the belief that the lesion is due primarily to a disease of the terminal branches of corneal nerves and that this hypothetic disease may lead to necrosis of Bowman's membrane. Kuan further speculates that the ring results from a secondary change—proteic precipitation, fatty degeneration, or mineral incrustation—in the periphery of the necrosed part of Bowman's membrane. Only three authors have reported the microscopic examination of the excised rings.

Jacoby and Dominguez have had the opportunity of examining a corneal white ring in an eye that was enucleated because of complications following cataract extraction. The cornea

was immediately excised and fixed in dehydrated alcohol, and was later embedded in paraffin and sectioned. The rings were found to be made up of clusters of globules, some in Bowman's membrane but some superficial and others deep to the membrane. No hyaline masses could be seen above Bowman's membrane either inside or outside the ring. In the ring proper, where the deposit was heaviest, no trace of Bowman's membrane could be found. Various chemical tests indicate that the deposits contain calcium phosphate but no iron. Other substances must be present, as the clusters do not disappear completely under the action of acids. The findings in this case lend no support to either the theory of Ballantyne or that of Kuan. (5 photomicrographs, references.)

John C. Long.

Leopold, I. H., Holmes, L. F., and LaMotte, W. O., Jr. **Local versus systemic penicillin therapy of rabbit corneal ulcer produced by Gram-negative rod.** Arch. of Ophth., 1944, v. 32, Sept., pp. 193-195.

Two methods of obtaining information concerning the routes of administration in experimental animals allow one to predict the results to be expected in human beings. Both methods are essential. The first is to determine the concentration reached in the cornea by the various means of administration; the second is to compare the effects of the two methods upon a standard lesion.

The experimental data of this work show that this Gram-negative organism, obtained by routine culture of material from the conjunctival culs-de-sac of rabbit eyes, is sensitive to penicillin in vitro. The experiments demonstrate that this organism can produce a corneal lesion when injected intracorneally. Development of the lesion can be prevented by local use of penicillin but not by intramuscularly administered penicillin. Once the lesion is established, local penicillin therapy benefits its course but does not prevent the occurrence of considerable ocular damage. Intramuscularly administered penicillin does not appear to alter significantly the course of the lesion when therapy is started 24 hours after injection. The organism was sensitive to the drug in vitro and in vivo, as determined by the "well" method of Fleming and associates. (References, 1 photograph.)

R. W. Danielson.

Pérez-Bufill, A. **The corneal grafting of cadaver cornea.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 464-470.

In the two cases of corneal transplantation here reported, the grafts were obtained from cadavers. The corneas of the hosts were almost totally opaque and very little improvement was obtained. J. Wesley McKinney.

Romero, Eduardo. **A frequent and definite keratitis.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 458-460.

Several cases of epithelial erosion of the cornea resulting from washing the head or face in alcohol are reported.

J. Wesley McKinney.

7

UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Ayberk, N. F. **About the three-symptom-complex.** Göz Klinigi, 1944, v. 1, no. 5, p. 197.

This is about a syndrome often called the Bechtsched syndrome. The

main factors of this syndrome are: hypopyon-iritis with tendency to relapses, aphthous disease in the mouth, and ulceration on the scrotum or in the vagina. All symptoms are caused by the same agent, which is supposed to be a virus. Inclusion bodies were found.

Joseph Igersheimer.

Crawford, Robert. **A case of corpora nigra with anterior synechia.** Brit. Jour. Ophth., 1944, v. 28, Aug., pp. 410-412.

Both irises showed large flocculi, one being attached to the back of the cornea. This flocculus had the appearance of being slightly stretched, and showed a bifurcation near the corneal end, although the end itself, about 2 mms. in diameter, was single. There was no loose pigment in the anterior chamber. It is suggested that in this patient one of the flocculi had passed through the pupillary membrane about the fifth month (when the marginal sinus is well developed and the anterior chamber is still shallow) and so had become adherent to the cornea. A brief description of the development of corpora nigra is given. (One illustration, references.)

Edna M. Reynolds.

Kosena, E. G. **The pathologic anatomy of traumatic iridocyclitis.** Viestnik Oft., 1943, v. 22, pt. 4, p. 33.

This is a study of transitional forms, from septic endophthalmitis to sympathetic ophthalmia. The material consisted of 700 eyes enucleated within a period of three years. In 20 of these there was clinically sympathetic ophthalmia. In the rest the enucleations were done to avoid sympathetic ophthalmia.

In 70 eyeballs the microscopic picture was that of sympathetic ophthalmia as described by Fuchs, or of a series of transitional stages between it and Fuchs's septic endophthalmitis. Of the 20 eyeballs, enucleated because the second eye developed sympathetic ophthalmia, 15 presented the classical microscopic picture of that disorder. A group of 47 eyes showed transitional stages, consisting in some cases of tuberculoid granulomata, and in others of changes characteristic of infiltrating uveitis and choroiditis. The rest of the 70 eyes had less pronounced uveal changes. The characteristic feature was their chronicity, associated in some cases, or in some areas of the same eye, with a tuberculoid structure, and in others with a picture of lymphocytic nodules. In 8 percent of the traumatized eyes removed for fear of sympathetic ophthalmia the pathologic picture was very close to the picture described by Fuchs as found after the second eye has become involved. This indicates that the conception of sympathetic ophthalmia described by Fuchs should be extended to include transitional and abortive phases.

Kosina supports the position maintained by Rohr in 1910, that the histologic difference between sympathetic ophthalmia and fibrinoplastic inflammation is only one of degree. She also believes with Meller that the initial stage of sympathetic ophthalmia is characterized by transitional histologic forms. She suggests that further elucidation of the pathogenesis of sympathetic ophthalmia may be afforded through the study of traumatized eyes enucleated prior to the development of clinical symptoms, to prevent sympathetic ophthalmia.

Ray K. Daily.

Spaeth, E. B., and De Long, P. **Detachment of the choroid.** Arch. of Ophth., 1944, v. 32, Sept., pp. 217-238.

The clinical condition commonly spoken of as detachment of the choroid

is probably a more common manifestation of a pathologic process in the globe than is generally supposed. It occurs not only with surgical procedures perforating the eye but also as the result of severe accidental trauma to the eye. It may be either hemorrhagic or nonhemorrhagic, and it appears as a terminal phase in pathologic conditions of the uveal tract.

The authors believe that the underlying pathologic process in the choroid is the same regardless of whether the condition is serous or hemorrhagic or both, and that the immediate cause may be connected with (a) an intraocular surgical procedure; (b) traumatic perforation of the globe, of either the posterior or the anterior segment; (c) trauma to the globe without perforation; or (d) inflammatory changes, which may be acute but usually are chronic and of long standing.

After corneoscleral trephining detachment of the choroid is common. Actually, it seems to be most common after this operation.

Fuchs classified choroidal detachments as serous, hemorrhagic (due to traction by cyclitic membranes) and transudative (as in an acute inflammatory process). The authors give twelve excellent case reports illustrative of these various types, and discuss the pathology in detail. Several photomicrographs of enucleated eyes are included. (14 figures, references.)

R. W. Danielson.

Visscher, M. B., and Carr, C. **The rate of entrance of radio sodium into the aqueous humor and cerebrospinal fluid.** Amer. Jour. Physiology, 1944, v. 142, Aug. 1, pp. 27-31.

The writers state that the rate of entrance of sodium isotope ions into the aqueous humor and cerebrospinal fluid is important in connection with the mechanism of formation and the fate of these fluids. They conducted experiments to determine the rate at which Rd Na_{24} approaches equilibrium between plasma and the fluids. The movement of sodium from the blood into the aqueous and the cerebrospinal fluid was studied in dogs of 10 to 20 kg., after intravenous injection of suitable amounts of the radio isotope as sodium chloride in an isotonic solution. After injection the blood level of Rd Na_{24} was determined on samples of arterial blood drawn from the femoral artery. The blood was rendered incoagulable by oxalate, and plasma was used for analysis. At various times after the injection the aqueous was withdrawn from each eye and the cerebrospinal fluid from the cisterna magna. The results, presented in tabular form, show an approach toward equality of Rd Na_{24} concentrations in plasma and aqueous over an hour after injection in animals anesthetized with nembutal, while in animals on which local anesthesia was used this rate was lower. The entrance of Rd Na_{24} into cerebrospinal fluid was much slower than into the aqueous. After lengthy discussion of the results obtained the writers admit that while the experiments reported in their paper add information concerning the problems of the mechanism of formation and absorption of the aqueous they do not permit a choice as to which is the more acceptable assumption. (References, 1 figure.)

M. Lombardo.

8

GLAUCOMA AND OCULAR TENSION

Rodigina, A. M. **Bilateral infantile glaucoma associated with bilateral hemangioma congenitale (nevus flam-**

meus). Arch. of Ophth., 1944, v. 32, Sept., pp. 214-215.

The author's case resulted in complete blindness at the age of 11 years. (One reference, 2 figures.)

R. W. Danielson.

9

CRYSTALLINE LENS

Archangelsky, V. H. **Prophylaxis in intraocular surgery.** Viestnik Oft., 1943, v. 22, pt. 4, p. 14.

Archangelsky advocates the use of a large preliminary conjunctival flap and a keratome-scissors incision in cataract extraction, as prophylactic against intraocular infection. The large conjunctival flap complicates somewhat the opening of the anterior chamber, but this difficulty is compensated for by the ability to make the incision exactly at the limbus, by having the surgical field completely isolated from the conjunctival surface, by complete closure of the wound, by firm coaptation of the lips of the wound, by isolation of the anterior chamber from the conjunctival sac immediately after the operation, by formation of a thin cicatrix, and by a less astigmatic postoperative correction.

Ray K. Daily.

10

RETINA AND VITREOUS

Ayres, Francisco. **Ophthalmoscopy in the hypertensions.** Arquivos Brasileiros de Oft., 1944, v. 7, June, pp. 95-110.

The author quotes extensively from various writers on the subject. (Nine illustrations, references.)

W. H. Crisp.

Bedell, A. J. **Ophthalmoscopic signs of terminal hypertension.** New York State Jour. of Med., 1944, v. 44, Aug. 1, p. 1675.

The author records 11 cases demonstrating ophthalmoscopic signs of terminal hypertension. The discussion is confined to only one phase of the immense problem of hypertension, namely what fundus signs suggest a serious outcome. Patients are separated into those who come early, when there is still time to give advice as to how to live; those who are seen when only by extremely good care can death be delayed even for a short period; and those who are already dying. The author points out that it is unwise to consider papilledema, or choked disc, as caused by hypertension until brain tumor has been excluded with exhaustive tests. The author's object is to show how fundus changes aid in arriving at an opinion as to the probable duration of life.

Theodore H. Shapira.

Gözcü, N. I. **Retinal hemorrhages as complication of malaria.** Göz Klinigi, 1944, v. 1, no. 5, p. 187.

Ocular complications are rare in malaria. They may be caused by the parasites themselves or may be a consequence of malarial anemia. The author reports two cases with retinal and preretinal hemorrhages. In the first case some of the hemorrhages showed whitish centers, in the second case there was a group of whitish spots around a preretinal hemorrhage. In this second case the general anemia was very marked and therefore the whole retina was very pale. Joseph Igersheimer.

12

VISUAL TRACTS AND CENTERS

Popov, M. Z. **Pathogenesis of the fundus changes in complicated craniocerebral injuries.** Viestnik Oft., 1943, v. 22, pt. 4, p. 19.

The fundus picture in infected wounds with large osteodural defects is different from that seen in noninfected wounds with insignificant osteodural damage. In the author's material, infected wounds of the brain associated with large osteodural defects showed rapidly a papillitis in the contralateral eye; while on the injured side there appeared only a slight blur of the temporal side of the disc, a filling of the excavation, and a slight constriction in the caliber of the veins. As the intracranial process progressed the contralaterial papillitis increased. On the injured side there was a hyperemia of the optic nerve, with increased blurring of the temporal edges of the disc and obscuration of the venous and arterial contours. The blood column of the veins became dull in the lower half of the disc, giving the impression of a diminished blood supply in this region.

In cases in which necrosis of brain tissue opened the ventricles and cerebrospinal fluid drained away, swelling of the disc and haziness of its contours diminished, the excavation of the nerve became distinct, and hyperemia subsided, but the haziness of the vascular contours persisted. Microscopically, in a fatal case the perineural spaces of the optic nerves were found infiltrated with round cells.

The fundus picture in cases of small noninfected craniocerebral wounds with insignificant osteodural defects was that of choked disc, differentiating this picture from that seen in septic processes, in which the veins are narrowed. In some of the aseptic cases there was a profuse exudate on the disc in the form of dots and striae, and small hemorrhages around the disc. Endophlebitis appeared early, giving the veins a segmented appearance. The ocular symptoms became more pronounced, with diminution of the cerebral pulse, increased dural tension, intense headache, and necrosis of the prolapsed brain.

The author explains the pathogenesis of the fundus picture as follows: The brain reacts to every trauma with edema and increased intracranial pressure. The edema decreases the elasticity of the brain and reduces the amplitude of its pulsations. This diminishes its aspirating action on the centripetal fluid surrounding the optic disc, and produces venous dilatation and stasis similar to choked disc. In large osteodural defects the intracranial pressure is diminished and the fundus changes are less pronounced. In septic processes there is, in addition, the destructive action of a toxic infective agent on the capillary membrane. It disturbs the normal exchange of fluid between the capillaries and the brain tissue, and albumin appears in the cerebrospinal fluid. Albumin also appears in the intercellular spaces of the brain, in the spaces of the optic nerve, and in the perivascular spaces; the dilatation of the perivascular spaces causes the venous constriction seen in the fundus.

The presence in some aseptic cases of exudates and hemorrhages on the surface of the disc is associated with the development of venous dilatation, slowing of the blood current, and increased permeability of the capillary endothelium. Ray K. Daily.

13

EYEBALL AND ORBIT

Abdulaev, G. G. **Enucleation of the shrunken eyeball.** Viestnik Oft., 1943, v. 22, pt. 4, p. 21.

After enucleating a series of shrunken and torn eyeballs, the author recom-

mends the following technique: preliminary pantopon or morphine injection; anesthesia through the skin, pushing the needle close to the orbital walls, and producing diffuse infiltration of the retro-ocular tissues; another injection through the scleral conjunctiva to anesthetize the anterior ocular segment. Lid elevators provide a more convenient field than a blepharostat. The conjunctiva is separated from the corneal remnant and the ocular muscles are separated from the eyeball, leaving all cicatricial tissue attached to the eyeball. The optic nerve is sectioned, the eyeball removed, and the conjunctival wound closed horizontally with a continuous silk suture. In primary enucleations the author uses no sutures. but in shrunken eyeballs the cicatricial edges of the conjunctiva unite better if sutured, and leave a better stump.

Ray K. Daily.

Brown, A. M. **Protheses for the eye and orbit.** Arch. of Ophth., 1944, v. 32, Sept., pp. 208-212.

Most commonly a prothesis is needed only after surgical exenteration of the entire orbital contents. In this process, two overcorrections are necessary. First, the entire orbit should be sculptured slightly higher on the face than its opposite; second, the conjunctiva should be slightly more visible in the prothesis than in the normal eye.

Negocoll was formerly used for making impressions, but was not entirely satisfactory since it had to be cooled to a desirable temperature and then used quickly within the critical period, the margin for error being rather narrow.

Modern compounds for negative impressions are greatly improved. They are supplied in the form of molding powders and require mixing with distilled water only. They are then spatulated to a smooth, air-free mixture, and the casting of the impression is done in the usual manner. These compounds require no special equipment and produce accurate, detailed impressions of eyes without bad aftereffects.

The author emphasizes that in sculpturing restorations the objective is not to create a beautifully modeled part which attracts attention and admiration but to fashion a restoration that will permit the patient to become inconspicuous. (6 photographs.)

R. W. Danielson.

Sverdlov, D. G. **Techniques of enucleation, and improvement of the cosmetic result.** Viestnik Oft., 1943, v. 22, pt. 4, p. 22.

The author urges the use of cadaver cartilage as implantation material in enucleations, and in plastic operations for improving an unsatisfactory stump. In injured eyes with torn conjunctiva it is important to introduce a prothesis at once or soon after the operation. Failure to do so produces distortion of the conjunctival sac by adhesions, which can be corrected only by further surgery. Ray K. Daily.

14

EYELIDS AND LACRIMAL APPARATUS

Katznelson, A. B. **When should restorative lid surgery be done.** Viestnik Oft., 1943, v. 22, pt. 4, p. 3.

After twenty months of war surgery done both early and late, Katznelson is convinced that early is to be preferred to late plastic repair. The most favorable time is when the wound has just closed and is not yet completely covered with epithelium. Early plastic surgery eliminates excision of the cicatrix, and the bed of the transplant is

formed by a cellular highly vascularized granulation tissue, which insures nutrition and vascularization of the transplant. Katznelson uses free skin-transplants from the back of the ear and the mastoid. In firearm injuries of the face the wounds are frequently very extensive and deep, reaching to the bone and sinuses. Resection of cicatrices in such areas may expose the nasal cavities and sinuses, and leave a very unfavorable bed for the transplant. Experience has proved that the transplant does not shrink after early surgery. It appears to the contrary that transplantation has a favorable effect on immature cicatricial tissue, and stimulates its absorption.

Ray K. Daily.

Leoz Ortín, G. **Abortive treatment of acute dacryocystitis.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 476-486.

Acute dacryocystitis may occur in three forms: (1) catarrhal inflammation of the mucosa of sac and duct; (2) pericystic phlegmon with or without eventual abscess formation; (3) combined inflammation of the mucosa and of the surrounding tissue. In the first type, the primary consideration is establishment of adequate drainage by introducing drops of cocaine and adrenaline into the sac, followed by massage and irrigation. After the sac is completely emptied a few drops of 2 or 3 percent silver nitrate are instilled. The treatment is carried out daily, and as the inflammation subsides cyanide of mercury or zinc sulphate replaces the silver nitrate. In a purely pericystic inflammation wherein fluid passes freely into the nose, the treatment is that of any phlegmon. If suppuration ensues, the abscess is incised without entering the sac. If the inflammation is both intracystic and extracystic, incision carried into the sac is usually necessary. J. Wesley McKinney.

López Enriquez, M. **Pseudo-dacryocystoblennorrhea.** Arch. de la Soc. Oft., Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 474-475.

In two cases a small sacular fistula opened into the lower canaliculus near the punctum. Pus exuded continuously from the lower punctum and lacrimation was an annoying feature. In each case careful excision of the fistula resulted in complete cure.

J. Wesley McKinney.

Prior Guillem, Antonio. **Permeability of the lacrimal canaliculi.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 487-488.

In 31 cases of obstruction of one or both lacrimal canaliculi permanent permeability was obtained. A probe insulated except at the tip is passed to the region of the obstruction. A diathermy current of 80 to 100 milliamperes is applied to the probe, and the diathermy current creates an opening through the obstructing cicatrix into the sac. The operation is followed by daily probing for eight to ten days. Permeability was permanent in all cases. J. Wesley McKinney.

Soria Escudero, M. **Unusual prelacrimal congenital malformation.** Arch. de la Soc. Oft. Hisp.-Amer., 1943, v. 3, Nov.-Dec., pp. 471-473.

A small sinus of 2-mm. depth over the right lacrimal sac had been present since birth. The sinus was extirpated and found to be lined by skin. No connection with the lacrimal sac could be demonstrated. The condition was evidently due to failure of fetal develop-

ment as to closure of this small segment of the nasolacrimal sulcus.

J. Wesley McKinney.

Tikhomirov, P. E. **Achievement of 25 years in the treatment of diseases of the lacrimal sac.** Viestnik Oft., 1942, v. 21, pt. 6, p. 39.

The first work on dacryocystorhinostomy in Russia was done by Awerbach, who in 1924 reported on 250 operations. By 1942 the number performed at the Helmholtz Institute was 6,000. There it is being taught to a large number of ophthalmologists, and it is now widely used throughout the Soviet Union. This operation restores to active service soldiers disabled by dacryocystitis, and should be performed by all ophthalmic surgeons and in all teaching institutions in the rear and at the front. Much work has been done on the treatment of epiphora not caused by dacryocystitis. The author has demonstrated that epiphora is more frequently caused by disturbances in the lacrimal punctum and canaliculus than by diseases of the lower portion of the system. The author and Pokhisova have both developed operations for eversion of the lacrimal punctum.

Ray K. Daily.

Williams, J. L. D., and Hill, B. G. **A simplified external dacryocystorhinostomy.** Brit. Jour. Ophth., 1944, v. 28, Aug., pp. 407-410.

A brief account of a technique which was used in six cases of dacryocystitis with stenosis of the nasolacrimal duct. The aperture in the bony nasal wall is made so that it lies directly opposite the medial aspect of the sac fundus. The mucoperiosteum of the nose adjoining the opening is removed, and no attempt is made to form it into a flap. An incision is then made in the medial surface of the lacrimal sac. This flap is hinged posteriorly, and is turned back to lie over the posterior lip of the opening into the nose. A piece of rubber tubing is placed through the nasal opening, projecting into the lacrimal sac for about 3 mm. and anchored at the external naris. Postoperatively, syringing through the lower punctum is carried out once daily, and the rubber tubing is removed after seven days.

The value of pre-operative lipiodol X-ray examination is stressed, as well as correction of any obstruction due to deflection of the septum.

Edna M. Reynolds.

PAN-AMERICAN NOTES

Miscellaneous

II Pan-American Congress of Ophthalmology. Preparations are being continued for the II Pan-American Congress of Ophthalmology, and it is hoped that the second meeting will be held in November, 1945, in Montevideo, Uruguay. This Congress takes pleasure in announcing the forthcoming visit of its president, Dr. Harry S. Gradle, who is planning a trip to various countries in Latin America. He will give lectures at the ophthalmologic centers in these countries.

International prize. The National Society for the Prevention of Blindness of New York offers a prize of $500.00 for the most valuable original paper adding to the existing knowledge about the diagnosis of early glaucoma or the medical treatment of noncongestive glaucoma. This award will take the place of two separate prizes of $250 each which had been announced some time ago.

Papers may be presented by any practicing ophthalmologist of the Western Hemisphere and may be written in English, French, German, Italian, Spanish, or Portuguese. Those written in any of the last four languages should be accompanied by a summary in English.

The award will be made by the Society with the guidance of an ophthalmologic committee composed of Drs. John N. Evans, Frank C. Keil, Daniel B. Kirby, Arnold Knapp, John M. McLean, R. Townley Paton, Algernon B. Reese, Bernard Samuels, Kaufman Schlivek, Mark J. Schoenberg, Manuel Uribe Troncoso, David H. Webster.

Brazil. The Minister of Education in Rio de Janeiro has appointed Dr. Silvio de Almeida Toledo to give a course in Trachoma in July of this year under the auspices of the National Department of Health. Trachoma is prevalent in Brazil. The State of São Paulo alone gave treatment in the year 1943 to 8,253 patients, distributed among the 54 units, dispensaries, and stations of the Health Department. At the same time it gave away more than a half million tablets of sulfanilamide. The number of eye operations made on these patients was 1,459. Folders and instructions to advise against the contamination of trachoma were distributed to 26,957 persons.

Guatemala. The Ophthalmological Clinic of the Casas del Niño was founded last year under the auspices of the Lions' Club of Guatemala. Dr. R. Pacheco-Luna is the Director. The babies are examined on entering, and periodically afterwards.

Perú. Eleven of the chief Peruvian institutions and seven of the best organizations of this nature in the United States have joined as sponsors of the Second Regional Institute in Administration and Organization of Hospitals which was held in Lima, Perú, December 3 to 16, 1944, organized by the Interamerican Association of Hospitals under the auspices of the Pan-American Sanitary Bureau.

The program was drawn up by a Consulting Committee presided over by His Excellency Señor Dr. Manuel Prado, President of Perú, and by an Executive Committee under the presidency of Dr. Constantino Carvallo, Minister of Public Health and Social Assistance.

The program for the Lima Institute included a series of conferences, practical lectures, and round-table discussions of the most modern equipment and latest techniques in hospital administration.

Societies

Argentina. III Argentine Congress of Ophthalmology was scheduled for the middle of the month of October, 1944. It was held at the city of Córdoba and lasted for three days.

The Sociedad de Oftalmología del Litoral has elected the following officers to serve during 1944-45: President, Prof. Dr. Carlos Weskamp; Vice-president, Dr. Luis A. Gallo; General secretary, Dr. Arturo Etchemendigaray; Treasurer, Dr. Rafael García Ocha; Members, Dr. Enrique V. Vertotto, Prof. Adj. Dr. Isaac Cotlier, Dr. Juan Maggi Zavalia, and Dr. Raúl Novick.

The "Ateneo de Extensión Oftalmológica" organized a lecture by Dr. Alberto Urrets Zavalia on June 28, 1944. The title of his paper was "Comments on ocular tuberculosis."

Brazil. The Ophthalmological Society of São Paulo, through its president, Prof. Moacyr E. Alvaro, organized a visit of São Paulo oculists to Bello Horizonte in the State of Minas Geraes. This visit took place July 11-13, 1944. On the 11th, a surgical session was held and Dr. Orville Conti performed two dacryocystorhinostomies and an operation for pterygium with Arruga's technique modified by the operator.

A scientific session was held and the following papers presented: Dr. Renato de Toledo, "Anesthesia in ophthalmic surgery"; Dr. Nicolino Rebello Machado, "The visual apparatus in cephalic traumas"; Dr. Orville Conti "Care in the cataract operation (during operation, preoperative, and postoperative)"; Dr. Laborne Tavares, "Laurence-Moon-Biedl's syndrome"; Dr. Oswaldo Silveira, "Iridocyclitis and in-

fected varicose ulcer," and Dr. Ennio Coscarelli, "Retrocorneal hyaline membranes." On the 12th, a round table discussion was held on the subject of "Difficult cases."

On the 13th another scientific session was held and the following papers were presented: Prof. Moacyr E. Alvaro and Dr. J. Mendonca de Barros, "File for glaucomatous patients"; Dr. Armando Gallo, "On the prevention of glaucoma"; Dr. Orville Conti, "Modification of Arruga's technique in the operation for pterygium"; Drs. Hilton Rocha and Amelio Bonfioli, "Gonioscopy and infantile glaucoma"; Dr. Laborne Tavares, "Cutaneous palpebral horn"; Drs. Hilton Rocha and Santiago Freire, "A new cycloplegic (preliminary report)."

The oculists from São Paulo were also given the opportunity of seeing the new public buildings constructed by the Municipal Government and of inspecting the social work carried out by the authorities.

Personals

Dr. Moacyr E. Alvaro, professor of ophthalmology of the Escola Paulista de Medicina, visited the United States in October, 1944, in order to attend the meeting of the American Academy of Ophthalmology and Otolaryngology in Chicago. During his stay in the States, Professor Alvaro was one of the speakers at the October 12th meeting of the Chicago Ophthalmological Society. His subject was "Clinical effects of local use of sulfonamides in the eyes," which will be published in this Journal.

Dr. Miguel Medrano, has been appointed professor of ophthalmology of the Faculty of Medical Sciences of the University of Guatemala.

Dr. R. Pacheco-Luna has been elected medical director of the Society for Protection of Children.

Dr. A. G. Arathoon, holder of a Pan-American Congress of Ophthalmology—Kellog Foundation Fellowship, has been appointed ophthalmologist to the Military Hospital.

We regret to announce the death of Dr. Gastão Torres, founding member of the Sociedad de Oftalmología e Otorrinolaringología of Rio Grande do Sul, Brazil.

Prof. Silvio Abreu Fialho, of Rio de Janeiro, was recently elected to the Brazilian National Academy of Medicine.

Dr. Eugenio P. Fortin, of Buenos Aires, went to São Paulo, Brazil, in July, 1944, to lecture at the Study Center and the Ophthalmological Society. His subject for the lecture at the latter was "The true capillaries of the retina with comments on the anatomy of the fibers of the macular region.

NEWS ITEMS

Edited by Dr. Donald J. Lyle
904 Carew Tower, Cincinnati 2

News items should reach the editor by the twelfth of the month

Deaths

Dr. Fletcher G. Asbill, Ridge Spring, South Carolina, died November 5, 1944, aged 76 years.

Dr. Thomas D. Brown, Ogdensburg, New York, died October 6, 1944, aged 71 years.

Dr. Harry X. Cline, Marion, Illinois, died October 15, 1944, aged 66 years.

Dr. George S. Dixon, New York, New York, died October 9, 1944, aged 91 years.

Dr. Clark B. Hatch, Newark, Ohio, died October 20, 1944, aged 65 years.

Dr. Frederick Krauss, Elkins Park, Pennsylvania, died October 9, 1944, aged 73 years.

Dr. John W. Moore, Gloversville, New York, died October 6, 1944, aged 66 years.

Dr. Leonard G. Redding, Scranton, Pennsylvania, died October 5, 1944, aged 59 years.

Dr. Wayne L. Snyder, Brookville, Pennsylvania, died September 23, 1944, aged 63 years.

Dr. Green B. Taylor, Cameron, Texas, died September 2, 1944, aged 69 years.

Dr. Hartwell Weaver, Dickson, Tennessee, died September 17, 1944, aged 59 years.

Miscellaneous

According to a recent announcement, Emory University will sponsor an ophthalmologic Seminar, from April 19th to April 21st, honoring the memory of Dr. Abner Wellborn Calhoun, M.D., L.L.D., who was born April 16, 1845. He was the first professor of ophthalmology of Emory University and a pioneer in Southern ophthalmology. All those interested in ophthalmology are invited to attend as guests of Emory University.

The guest speakers on the program will be Dr. W. L. Benedict, Dr. John Dunnington, Dr.

Harry S. Gradle, Dr. Parker Heath, Dr. Walter I. Lillie, Col. Derrick Vail, and Dr. Frank Walsh.

The fifth semi-annual refresher course in laryngology, rhinology, and otology will be conducted by the University of Illinois, College of Medicine, at the College in Chicago, March 26th to 31st inclusive. As the registration is limited to 30, applications will be considered in the order in which they are received. The fee is $50.00. When writing for application please give details concerning school and year of graduation, and past training and experience. Write to Dr. A. R. Hollender, chairman, Refresher Course Committee, Department of Otolaryngology, University of Illinois, College of Medicine, 1853 West Polk Street, Chicago 12, Illinois.

The Toledo Hospital Institute of Medical Research has been given a grant of $6,500 a year for a two-year period by the Synder Ophthalmic Foundation for research on the physiology of the eye especially in relation to glaucoma. Because of the war, research will be delayed until a physiologist with specialized training in the eye is available.

The first Gifford Memorial Lecture was given at 7:30 p.m. on Monday, January 15, 1945, at the Continental Hotel (formerly the Medinah Club), 505 North Michigan Avenue, Chicago, Illinois. The speaker was Dr. Francis Heed Adler, of Philadelphia, who delivered a paper on "The pathologic physiology of convergent strabismus."

Societies

The Washington, D.C., Ophthalmological Society held its regular meeting on January 8, 1945, at the District of Columbia Medical Society Building. The guest speaker was Dr. Ralph I. Lloyd of Brooklyn who presented a paper on "Proptosis." A motion picture on "Extraction of magnetic and nonmagnetic foreign bodies" was given by Dr. Arno E. Town. The following cases were presented: "Perivasculitis" by Dr. Sterling Bockoven; "Pulsating exophthalmos" by Dr. Ronald A. Cox; "A detachment of the retina" by Dr. Paul Levatin; "Unilateral trachoma—questionable" by Dr. Roy A. Stewart; and "Disciform degeneration of the macula" by Dr. Richard Wilkinson.

The 824th meeting of the Milwaukee Academy of Medicine was held jointly with the Milwaukee Oto-Ophthalmic Society on Tuesday, December 19, 1944.

At the December meeting of the Brooklyn Ophthalmological Society Dr. James W. White spoke on "Choice of the fixating eye" and Dr. Rudolf Aebli discussed "The relationship between ptosis and ocular-muscle anomalies."

Personals

On December 14, 1944, at the New York Eye and Ear Infirmary, E. M. Burchell, D.Sc., was honored by that institution in recogniton of the 50 years of service he has rendered it. Honorary membership in the American Academy of Ophthalmology and Otolaryngology was conferred by Dr. William L. Benedict. Since the event has been reported in various news magazines, the Journal will content itself with joining with the medical and scientific world in wishing Dr. Burchell joy of his well-deserved honors.

Dr. Henry Haden was the guest of the St. Louis Ophthalmic Society on the evening of January 26, 1945. After a dinner given by the Society in his honor, Dr. Haden presented a classical paper on the comparative development of the retina and the brain in human embryos up to 40 mm. The similarity in the structure of the two organs as they develop was beautifully illustrated. It is hoped that this paper can be presented to the readers of the Journal during the coming year.